THE REGULATION OF WATER-USE IMPACTS OF FORESTRY IN SOUTH AFRICA: APPRAISAL OF THE DEVELOPMENT OF POLICY AND GOVERNANCE

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Abstract

Plantation forestry is controversial and conflict-ridden. Even so, most such forests are well managed in South Africa; over 80% of the plantation forest estate in South Africa is certified as being sustainably managed in terms of the Forestry Stewardship Council scheme. Plantation forests provide the only significant renewable resource for the lumber, paper and board products required to satisfy development needs. This paper addresses aspects of joint or overlapping forest and water policy in South Africa. Since proper governance begins with appropriate policy and its instruments, we therefore examine relevant aspects of policy as well as of governance together, rather than governance alone.

Available assessments indicate that South Africa’s development strategy is now being impeded by various shortages, including a shortage of forest products, and that this situation will worsen in future. In 1998, new provisions, for the licensing of stream flow reduction activities (in effect, only plantation forestry, for commercial purposes) took effect through the National Water Act. Government has instituted these new requirements in a manner that takes account of the complementary policy fields involved in such regulation, so as to achieve cooperative governance as required in the Constitution. This converges on an agreed procedure for administering applications, a procedure that is now in an advanced draft. The procedure involves 50 steps or activities and three government agencies who collectively form a Licence Assessment Advisory Committee for each province within which commercial forestry is practised. The steps in the process include several that are time-consuming and onerous.

The annual rate of afforestation in South Africa has declined. Expansion since 1990 amounted to a mere 6,000ha. This trend is attributed at least in part to the new governance arrangements, rather than the new policies. This outcome conflicts with government’s stated intent respecting forests, water and economic and social development. We examine possible causes of and remedies for this situation.

Introduction and Background

South Africa has about 1.4 million ha of plantation forest, delivering about 18 million cubic metres of timber per year. Most of this is for domestic consumption, though a substantial fraction is currently exported, as wood chips, pulp, and paper. In South Africa (as elsewhere), plantation forestry is controversial and conflict-ridden. Even so, most of these forests are well managed; over 80% of the plantation forest estate in South Africa is certified as being sustainably managed in terms of the Forestry Stewardship Council scheme.
Plantation forests provide the only significant renewable resource for the lumber, paper and board products to satisfy development needs. At present, the per capita consumption of paper and board in South Africa is 42 kg per year, and of lumber, about the same (Table 1). Per capita consumption in the developed world is much higher. Even Malaysia’s consumption is nearly twice that of South Africa. This difference reflects the shortfall in well-being among South Africans (see below).

Contending interests in the fields of land use, water, biodiversity all come into play in the governance of plantation forests, even though we are here considering the water law. Several statutes regulate these interests. This paper addresses aspects of joint or overlapping forest and water policy in South Africa. We take the position that proper governance begins with appropriate policy and its instruments, and therefore examine relevant aspects of policy as well as of governance together, rather than governance alone. We focus on plantation forestry.

Table 1. Selected comparative statistics for water availability and forest products consumption in a range of countries. Sources: Unesco 2003; http://www.unesco.org/bpi/wwdr/WWDR_chart1_eng.pdf; www.swivel.com; wfi.worldforestrycenter.org; faostat (all as on 17 March 2008).

<table>
<thead>
<tr>
<th>Country</th>
<th>Per capita renewable water (for USA, conterminous only)</th>
<th>Per capita consumption of paper and board (kg per year)</th>
<th>Per capita consumption of sawn boards (kg per year)</th>
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<td>South Africa</td>
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<td>42</td>
<td>58</td>
</tr>
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<td>Malaysia</td>
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<td>88</td>
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<td>USA</td>
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We argue, in the section that follows, that resolution of the joint aspects of forestry and water policy is an important and urgent matter for South Africa’s sustainable development and the attainment of its development goals. However, this is also difficult, largely because however these things are resolved, parts of the solution will be anathema to one or more significant parties to the issue. The fact that the Constitution of South Africa, as well as relevant national statutes, requires cooperative governance in government sharpens the requirements in this respect. We examine the recent history of forest development and of knowledge and policy in this field, since history is the key to the present. We evaluate the current set of policy instruments and their requisite governance framework with respect to recent performance, in the light of development objectives. The paper concludes with a forward view on what may need improvement and what options for improvement may might be available, and suggest which might be best for South Africa. We then consider the future in other parts of Africa.
The Context: Water, Biodiversity and Forestry and Development in South Africa

Water and Plantation Forests

The assumption underlying water policy is that South Africa is a water-scarce country. The amount of “renewable” water (mean annual runoff; 49,000 million cubic metres per year in South Africa; Department of Water Affairs and Forestry 2004) per person is 1,154 cubic metres, about four times that in Israel (276), and one-third that in France (3,439) (see Table 1). Of the country’s “available” water, i.e. the water yield, or the fraction of runoff that may reliably be allocated for use (about 13,227 million cubic metres per year), about 62% is used in irrigated agriculture, and of this much is lost in leakage or wasteful use (estimates range up to 40%). The consumptive use attributed to plantations forests is 3% of yield. The attributable water use in these forests is thus a small fraction of that wasted in irrigation. Consumptive water use by plantation forests is the incremental difference in evapotranspiration from such a forest, relative to that from the vegetation cover that it replaces (e.g Dye and Versfeld 2007).

Plantation Forests and Biodiversity

South Africa has highly biodiverse ecosystems, many of the most important being those that are best for plantation forestry. Afforestation impacts biodiversity, since it replaces natural grasslands and other indigenous vegetation, thus reducing biodiversity. In a recent biodiversity assessment for the biodiversity conservation plan for province of Mpumalanga, Ferrar and Lotter (2007) classified plantation forests with dryland crop cultivation, intensive animal farming, and irrigated crop cultivation as being land uses “that have moderate to high impact on biodiversity”. They recommended that it and the land uses of similar impact should be permitted only in “Areas of Least Concern”, i.e. with low biodiversity priority.

Plantation Forests and South Africa’s Development Imperatives

Government policy on forestry requires the following: “the overall goal of government is to promote a thriving forest sector, to be utilized for the lasting benefit of the nation, and developed and managed to protect the environment” (see, for example, Tewari 2001). The development strategy of the Government of South Africa, Asgi-SA, has the principal overarching goal of halving poverty between 2004 and 2014, focuses on the key themes of economic growth and development, and improving the quality of life. The forest and forest products sector has been included in the Asgi-SA sector and industrial strategies, as contributor to this overall development strategy. In addition, the “binding constraints” to be addressed, including infrastructure development, as well as the housing goals for the quality of life theme are both dependent on the forest products sector for necessary inputs.

The role of the forest products sector in the country’s development goes beyond its direct role in this strategy. For example, IIED estimated that for a sustainable economy, a country needs to provide for the consumption of about 60 kg per person per year of the paper and board products. This is to satisfy people’s reasonable needs for hygiene, education, communication and other uses basic to a reasonable quality of life. This is conservative: consumption in Malaysia is 88kg per person per year, and in Israel, 122 (Table 1; the US consumption is 312). South Africa’s current consumption is 42, indicating that we need to provide for at least a 50% increase, but probably best 100%. Lumber (sawn boards) consumption is 58 kg per person per year, and the indications are that a substantial rise in this consumption is needed,
since the supply of lumber has emerged as a constraint to the country’s infrastructure programme, especially housing (Singh, no date), while the supply of timber for mine supports is a bottleneck in mining development (ForestrySA personal communication).

Beyond this is the crucial requirement for the maintenance and expansion of the manufacturing sector in South Africa, in order to secure a higher rate of employment creation than has been achieved over the past 15 years. The forest products sector has been an important component of manufacturing employment in the country, part of which has been dependent upon the exports of wood chips and pulp and paper. Meanwhile, South Africa’s non-mineral tradable sector has shrunk markedly since the early 1990s (Rodrik 2006) and manufactured exports of all kinds have fallen rapidly since a maximum in around 1980, compared with other commodity-based economies such as Argentina, Australia, Canada and Malaysia (Hausmann and Klinger 2006). A central part of the country’s new development strategy is growth of the non-minerals manufacturing sector, including forest products.

Finally, the forest sector makes an important contribution to rural development, since most of the forests and their downstream industries are located in the countryside. Historically, plantation forest industries have played an important part in promoting the extension and maintenance of infrastructure, the dissemination of technologies into the countryside, and the building of rural human capital. Since rural poverty and unemployment are especially marked, and South Africa’s agrarian population still disproportionately high (Table 1), this contribution has strong merits.

However, in the face of the sector’s relevance to the country’s development, a substantial shortfall in the domestic supply of forest products has emerged, and is set to intensify. Estimates of the area of new afforestation in South Africa that would be required to satisfy the growth of demand by the year 2030 are around 700,000ha (e.g. LHA 2004). Meanwhile, domestic prices for timber have increased substantially and continue to escalate, contributing to inflationary pressures affecting development programmes. In parallel with this is the current stagnation in afforestation, with the real possibility of a net reduction in afforested area (see below).

The options for achieving a secure contribution of the forest products sector are not simple. Substitution of steel, concrete and plastics for timber is an improbable option, given the fact that it has not happened in the past when commodity prices were perhaps more favourable, and given the recent rapid increase in the prices of these commodities. Switching to imports, of timber or of processed products, will face the problems of global shortfalls in supply, driven by commodity demands from the growing economies of China and India. Second it carries the real risk of the comparative loss of employment-generating manufacturing opportunities through rural de-industrialisation, and increased currency volatility owing to effects on the trade balance and the current account deficit. Switching current exports to the domestic market carries the same, or similar risks.

Improvements in yields from current plantations are attractive; industry experts suggest that yield improvements of 20-25% have been achieved (ForestrySA personal communication), though without indicated the period over which the gains have been achieved. Such gains have however already been factored into projections of future timber yields. A recent complete and thorough appraisal of all official studies of the extent and location of land that is suitable for and could be available for afforestation indicated, from a careful summation of the official estimates, that an additional 200,000ha would be suitable and available, while a
maximum of as much as 575,000ha would be suitable. But the availability of this land is uncertain, principally due to policy, regulatory and institutional uncertainties (CIC International 2006). Clearly, policy must confront these options, and the one that would have immediate advantage is new afforestation, even if not all the future needs may be met through that option.

**Water and the Management of Water Use**

Tewari (2001), Jacobson (2003), and Dye and Versfeld (2007) provide recent outlines of the technical, policy and political history of developments leading to the current regulatory regime applied to plantation forests in South Africa. The National Water Resource Strategy (Department of Water Affairs and Forestry 2004) summarises the intent of water-management policy as follows: “The National Water Policy (1997) and the National Water Act (1998) are founded on Government’s vision of a transformed society in South Africa, in which every person has the opportunity to lead a dignified and healthy life and to participate in productive economic activity.” Regarding water use, the Act itself has the central purpose of achieving “the equitable allocation and beneficial use of water in the public interest”. Further, the aim is “to achieve sustainable use of water by making progressive adjustments to water use with the objective of striking a balance between water availability and legitimate water requirements, and by implementing measures to protect water resources.”

The Act requires water uses (it identifies several kinds) to be licensed; the license provides a temporary, five-year (renewable for 40 years in the case of plantation forests), right to use water, and in turn is employed to allocate use rights. The Act classifies plantation forestry as a use called stream flow reduction activity, since it involves the consumptive use of water through evapotranspirative loss, before water reaches the manageable and allocatable fraction of the resource. The Act also provides for water pricing as an incentive for efficient use, as well as water conservation and water demand management, which relates to the efficient and effective use of water and to the minimisation of loss and wastage of water, and are important elements of the approach to the care and protection of water resources. It also allows the trading of water-use licences. A vital element of the NWRS is the progressive decentralisation of the responsibility and authority for water resources management to statutory catchment management agencies and, at a local level, water user associations. These institutions, representative of water users and other stakeholders, will facilitate effective participation in the management of water resources in their areas (Department of Water Affairs and Forestry 2004). These new entities are still mostly in the process of establishment. Finally, the Act provides for a Water Tribunal, for appeals against official decisions.

**Governance Arrangements for Regulating Plantation Forests**

**Governance**

We follow the definition of governance in Graham et al. (2003). “Thus governance is a process whereby societies or organizations make their important decisions, determine whom they involve in the process and how they render account.” It requires “a system or framework upon which the process rests - that is, the agreements, procedures, conventions or policies that define who gets power, how decisions are taken and how accountability is rendered”.

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In the context of this paper, governance is about the arrangements and procedures required to institute the policy that results in the regulation of plantation forests. However, plantation forestry is also regulated by parallel policies and statutes. These are: forestry (the National Forests Act), environment (the National Environmental Management Act, with its subordinate statutes for biodiversity and protected areas), and agriculture (which through the Conservation of Agricultural Resources Act, provides for soil conservation).

Until 1991, afforestation was regulated through the provisions of the then Forest Act, which required a permit for any proposed afforestation, and was administered by the entity for forestry in national government, sometimes a full Department, sometimes not. In 1991, the function was transferred to the Water Affairs entity in the national Department of Water Affairs, to avoid conflict of interest between the promotion of the forest sector, and the promotion of water interests. In 1998, the relevant provision in forest law was annulled, and the new provisions, for the licensing of stream flow reduction activities (in effect, only plantation forestry, for commercial purposes) took effect through the National Water Act.

Government has instituted these new requirements in a manner that takes account of the complementary policy fields involved in such regulation, so as to achieve cooperative governance as required in the Constitution. The Department of Water Affairs and Forestry has over several years worked with its partners within government and outside to develop an agreed procedure for administering applications, a procedure that is now in an advanced draft.

This procedure involves 50 steps or activities, and three government agencies, the Department of Water Affairs and Forestry (only its Water Affairs entities, at both regional and national levels, and not its Forestry entity), the provincial or national Departments of Agriculture, and the provincial government entities responsible for environmental affairs. These agencies form a Licence Assessment Advisory Committee for each province within which commercial forestry is practised. The steps include several that are time-consuming and onerous. Not every one of these is the responsibility of the applicant, but each is required before an approval or rejection is achieved. These are:

- A determination of the streamflow reserve (the ecological flow requirement) for the catchment at issue, i.e. a quaternary catchment, to be undertaken by the regional office of the Department of Water Affairs and Forestry, but requiring specialist services from a consultant (this is to be done once only for any catchment in any cycle of planning)

- A preliminary hydrological assessment of the predicted effects on water yield of the proposed afforestation, to be undertaken by the regional office of the Department of Water Affairs and Forestry, but usually requiring specialist services from a consultant; this involves a decision as to whether or not there is water available in the water account for that catchment to allocate to the proposed forestry project

- An environmental impact assessment, in terms of environmental regulations, to be commissioned by the applicant and undertaken by an accredited environmental consultant, for an environmental approval by the provincial environmental entity

- A reconnaissance soil survey, to be commissioned by the applicant and undertaken by a qualified consultant, for consideration by officials of the implications relevant to agriculture law and official assessment of the sustainability of the proposed afforestation.
Although the Licence Assessment Advisory Committee charged with this administration consists of government officials, the steps summarised above involve substantial requirements for consultation among stakeholders outside government, including environmental groupings, traditional authorities, and others. These activities are interspersed with provisions for requests for additional information, and review and appeal processes.

The activities specified above can be lengthy. For example, for the province of Limpopo, Sandham et al. (2005) report that impact assessments for land-use change such as afforestation required three to six months or more, from application to record of decision. A streamflow reserve determination, even if following the specified rapid procedure rather than the intermediate or comprehensive, requires the procurement of specialist services, and field assessments during low-flow and spate conditions; this may take months.

Outcomes of the Arrangements

Howard (2005) has reported on an analysis of 495 applications to plant forests, in two provinces, KwaZulu-Natal and the Eastern Cape, the provinces in which the greatest potential for expansion remains. Estimated costs to applicants were about R20,000, so the total cost would have been about R10 million (excluding administrative costs to the taxpayer, which he suggested amounted to R100,000 per case). The applications were received during the five years from 2000 to 2004. For the first province, about 30% of the applications have been approved, for an area of about 7,000ha. This equates to a prospective investment of about R30 million (about US$4 million). In the Eastern Cape, 44% had been approved. There are among these applications that have not been resolved after four years.

Overall, the annual rate of afforestation in South Africa has declined. Areas previously afforested have been deforested, to meet environmental standards such as the protection of riparian zones, because of their being unprofitable under (previous) timber price regimes, and for other reasons. The result is that in 2007 the net afforested area declined by about 3,000ha, and the expansion since 1990 amounted to a mere 6,000ha.

Further Considerations: Governance at the Strategic Level

Over the period from 1976 to the present, government has made several attempts to reconcile the conflicts inherent in afforestation, focusing on the need to protect water supplies but also addressing the need to protect food security and biodiversity (CIC International 2006). The result has been as series of guidelines, which involved the redlining of certain catchments as being excluded from further afforestation, and later, effectively whole provinces. At the same time, these attempts identified catchments within provinces where afforestation could proceed, and could be promoted. The most recent attempt was a strategic environmental assessment of the Eastern Cape, in which, by careful scrutiny of the findings, it transpired that about 250,000ha may be available. These attempts have had no consequence as yet; in spite of the Eastern Cape being earmarked in the national development strategy for forest sector development, there has been little progress to date.

In addition, biodiversity conservation planning, such as in the Mpumalanga Biodiversity Conservation Plan (Ferrar and Lotter 2008) has categorized the land and ecosystems in priorities for biodiversity protection, providing guidelines that may govern afforestation as well as other land-use change (but there, a moratorium on further water use by plantations precludes any further afforestation).
Assessment and Conclusion

South Africa

South African water policy and its adjuncts, environmental and agricultural policy, has decentralised the governance of the regulatory regime applicable to plantation forests to Licence Assessment Advisory Committees, one each for the five provinces in which commercial forestry is feasible. These Committees will in time become entities within those of the 19 statutory Catchment Management Agencies that administer areas that include forestry.

Thus far, this system of governance has not served the country’s goals. It has proved costly and slow, and seems to have diverted investors from forestry (whether large or small). There is evidence that it is causing landowners to plant forests illegally. We see, above, the vital role of the forest sector in the country’s development, and the fact that increased timber supply is urgent and necessary for this development, and that expansion is possible, and that a strong market for forest products exists and grows. Since most plantation forest are certified as sustainable (see above) we know that good management, to reasonable standards, can and has been achieved, afforded from revenues to profitable forest operations, i.e. without cost to the state. Nevertheless, expansion does not occur, government intent notwithstanding. As we see from 2.1 above, water policy is not about preventing water use, but rather about promoting equitable and efficient use. There are many obstacles facing expansion of the forest industry. These include willingness among investors to enter the field, depending in turn on the need for a policy environment that creates and appetite for investment in the sector; since forestry is a cost-control business if it is to be profitable, the investment climate depends on avoidance of unnecessary costs. The obstacles include the special challenges of development in areas where most of the land is held in communal tenure. The role of the new policies, their instruments and the institution of their governance must surely be designed to help overcome these challenges, but appear not to be achieving this.

There is a puzzling asymmetry in the implementation of water and environment when it comes to forestry. Plantation forests consume a small fraction of the country’s water supplies, yet their development is regulated to the point of stasis, while other sectors are disproportionately favoured. Tewari (2001), like others, calls plantation forest species “water-hungry alien species” (echoing the Timberwatch Coalition, a local NGO opposing plantation forests and FSC certification, who state that these forests “Consume excessive water and cause increased runoff” (see http://www.timberwatch.org.za/articles.htm as on 18 March 2008). This is despite evidence to the contrary and that that in these high-yielding forests efficiency of water use greater than native or slow-growing forests. Furthermore, silvicultural treatment may increase the efficiency of resource use (i.e. also water use) (Binkley et al. 2004). Work on Eucalyptus grandis in South Africa indicates a similar trend (Dye et al. 2006). Such asymmetry is not the policy intent in any of the instruments at issue here.

Tewari (2001) suggests that the reforms of the 90’s has realigned the stakeholders into a new configuration of “actor constellations” and “major advocacy coalitions” with changing political resources, and the net outcome has been a balancing of the advocacy coalition for commercial forestry, with the emergent environmental advocacy coalition, to correct a past imbalance in favour of commercial forestry. This may indeed be a large part of the reason for the situation. If that is the case, given the policy imperatives for a developmental state in
South Africa, then the system of governance here has failed thus far to serve its necessary public purpose.

It is difficult without further diagnosis of the problems in this system of governance to suggest solutions. However, there do seem to be three possibilities: (a) participants do not share the same (scientifically valid) information (b) some parties, such as government advocates for forestry, are absent from decision-taking and there is thus an asymmetry of interests in the institutions and (c) perhaps most important, interested parties are not equally capable land empowered to make their cases, perhaps because the place of each decision in the overall development strategy is not adequately transparent. Perhaps, fundamentally, the system is unworkable within reasonable timespans (the time needed to address South Africa’s development gap) and that a move towards arms-length regulation, through a combination of statutory minimum standards and the market-based and co-regulatory measures as captured in sustainability certification, and provided for in the National Forests Act. This would however require clear and consistent leadership from government, and the agreement of the environmental advocacy coalition.

Whereas the average South African uses 42 kg per year of paper and board, the average African uses 4. This correlates with a crippling gap in well-being and quality of life: poor education facilities, poor health, and poor communication. Closing such a developmental gap will among other things involve about a 15-fold increase in fibre supply in about the next generation. This will put the average African on about the same plane as the average Malaysian is today. This is not a resource that can be supplied sustainably from equatorial rainforests, or from miombo woodland. It will necessarily come mainly from new plantation forests, possible 10 million to 20 million ha in extent. Such development needs to be designed for sustainability from the start. The technologies, and management systems developed and used in South Africa plantation forestry offer part of a way forward, and the policies and their instruments that govern this development also offer useful insights, but the system of governance appears to need more study before we can learn useful lessons from it.

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References


