

BALANCING COAL MINING AND CONSERVATION IN SOUTH-WEST ETHIOPIA

KASSAHUN KELIFA SULEMAN

EXECUTIVE SUMMARY

Ethiopia is confronted by the challenges of a growing population and a diminishing natural resources base. The country's economic growth has relied heavily on agriculture, but progress in this sector has been hampered by the lack of access to agricultural inputs like fertiliser. Ethiopia has devised a range of development strategies for meeting agricultural and energy needs through the extraction of coal resources.

Exploiting the considerable coal deposits found in Ethiopia's south-western Afromontane forests would produce coal phosphate fertiliser and electricity in the coming decades. However, the forests are sites of exceptional biodiversity. With these conflicting interests in an area of high biodiversity, Ethiopia now faces pressure from competing uses of forestland, forcing the government to identify ecologically and economically feasible approaches to reconcile biodiversity conservation and coal extraction.

INTRODUCTION

A large proportion of mineral exploration and extraction across the world occurs in areas where poverty is pervasive and biodiversity is threatened. Almost three-quarters of active mine exploration and extraction sites are in areas regarded by conservationists as intact bionetworks with considerable ecological value.¹ As a result, there is increasing emphasis on reducing the

AUTHOR

DR. KASSAHUN KELIFA SULEMAN is a Researcher with the Governance of Africa's Resources Programme at SAIIA.

impact of extractive industries on the environment, as well as the need to improve the welfare of the communities who depend on ecosystem services for their livelihoods.

The south-west region of Ethiopia offers an important case study for the conservation–mining dilemma. Proponents of extractive-led development trajectories, from within the Ethiopian government and externally, emphasise the attainment of economic growth targets through the extraction and processing of coal from within a designated conservation space, the Yayu Coffee Forest Biosphere Reserve. Social and environmental advocates have, however, raised concerns about the potentially negative impact of the coal mining operation, arguing that coal exploration and processing will cause irreversible damage to the forest ecology and the wellbeing of local communities. This paper examines the conservation–mining dilemma in south-west Ethiopia, highlighting the current trends in local resource extraction and its socio-ecological effects in order to inform policy recommendations that create a balance between conservation and mining.

RETHINKING THE CONSERVATION–MINING NEXUS

There is abundant research that explores the connections between biodiversity conservation, poverty and mining. In recent years, large-scale mining activities in biodiversity hotspot areas have received much attention, particularly in countries where governments have opened up conservation areas for extractive operations. However, the dynamic and complex interrelation between the conservation of plant genetic materials and coal mining when they coexist in a biodiversity hotspot space remains poorly understood.

The geographical overlap between mining sites and biodiversity hotspots often leads to serious social and ecological challenges over the short and long term. Some of these challenges include a growing population in and around forests, conversion of forestlands into mining and agricultural areas, and the presence of human settlements. The challenges become more pronounced in areas where conservation spaces are not legally or formally recognised or such territories are not properly defined and demarcated. Concerned about existing anthropogenic impacts on biodiversity, environmentalists and conservation organisations have warned policy makers that human influence on biodiversity will continue to increase exponentially, eventually leading to extensive environmental degradation. This ecological forecast rests on two underlying realities. First, a large proportion of the world's biodiversity resources have not yet been earmarked as strictly protected spaces.² Second, the spaces that are recognised as conservation frontiers often suffer from poor administration and management, a shortage of funding and spatial separation from other high biodiversity areas.³

The challenges of overlapping land use systems are not new to Africa. Several countries have been struggling to resolve socio-ecological problems associated with competing interests over resources and spaces, which have resulted in undesired outcomes such as ecological degradation, livelihood deterioration and social upheaval. The failure to address inherent problems of competing land use systems can be attributed to contradictory laws, inconsistent information, the lack of a centralised database on land use systems and weak inter-sectoral linkages.

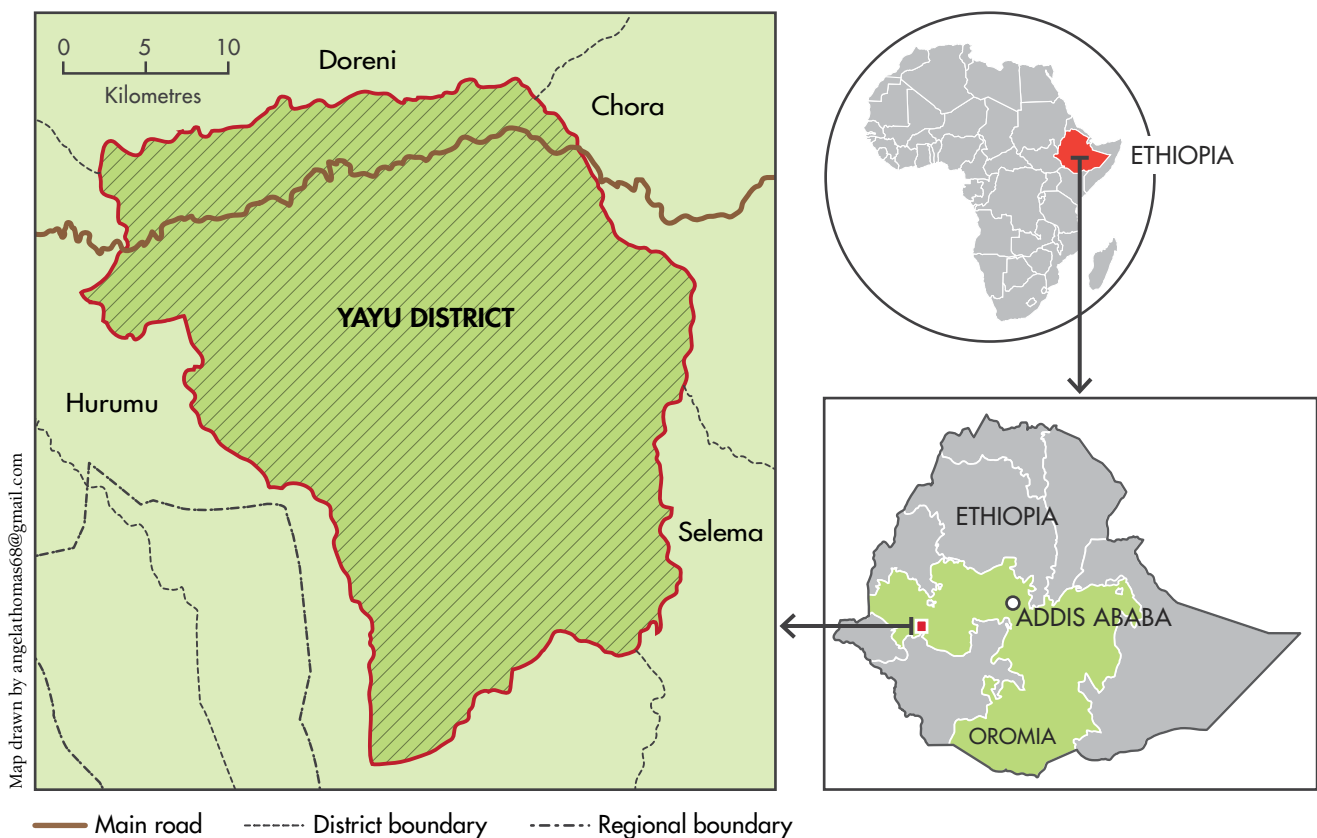
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However, such competing interests can be mediated and resolved if appropriate policies and decision-making frameworks are in place, as well as appropriate information systems to support decision making, such as a central online cadastre of land allocations.⁴

EMERGING REALITIES IN SOUTH-WEST ETHIOPIA: THE COAL AND WILD COFFEE DILEMMA

The Great Rift Valley divides the Ethiopian highlands into the south-west and north-west highland plateaus. The south-western Afromontane forests are the primary centre of diversification and the only place in the world where genetically diverse species of *Coffea arabica* grow in their original habitat. The Yayu coffee forest, situated some 560 km south-west of Addis Ababa, is an essential component of the Afromontane forest ecosystem (Figure 1).

FIGURE 1 THE YAYU DISTRICT IN SOUTH-WEST ETHIOPIA

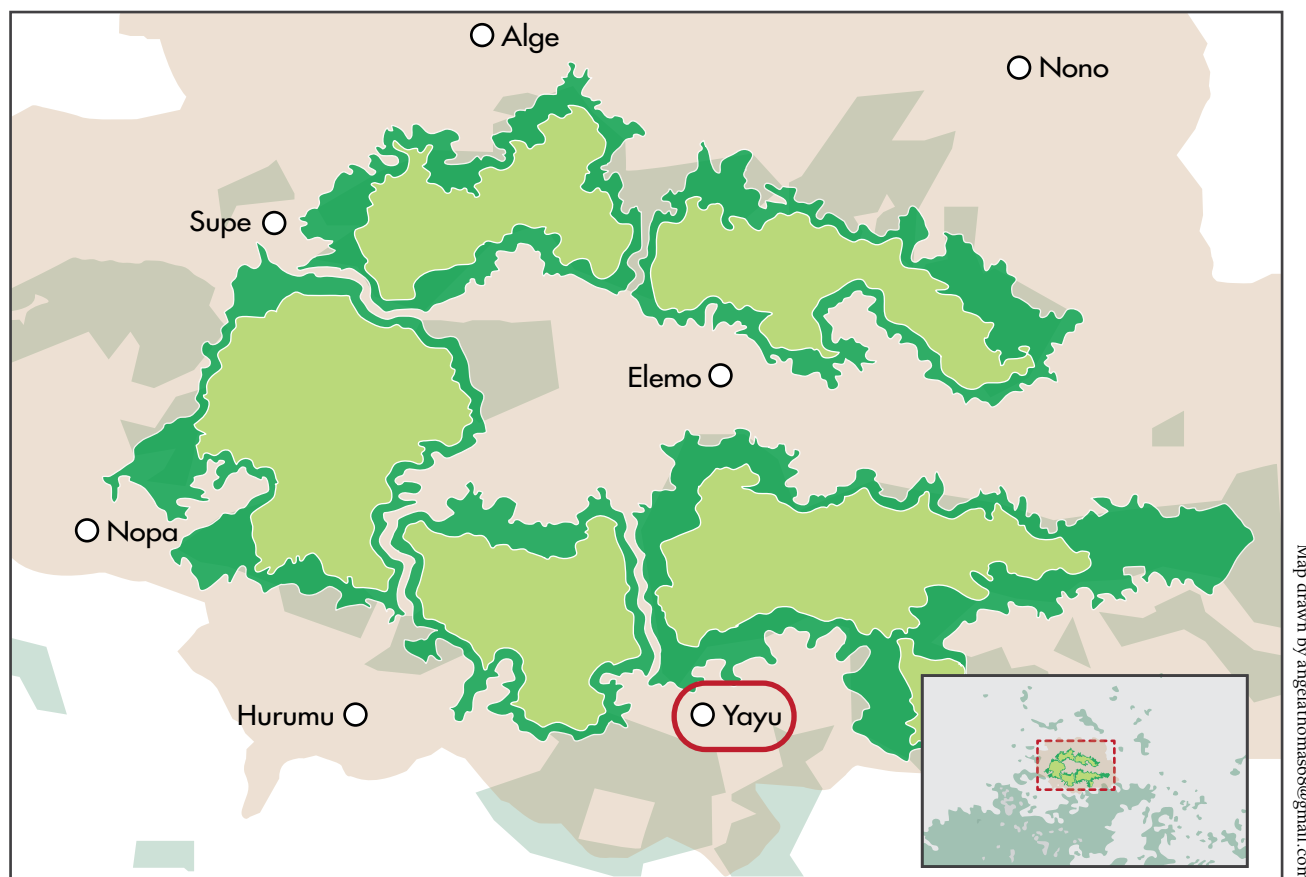


Source: Author

Containing the last remaining montane rainforest fragments with wild *Coffea arabica* populations in the world, the coffee forest was designated as a national forest priority area in the early 1990s and recognised as a UNESCO Biosphere Reserve in 2010⁵. The biosphere reserve, which covers a total land area of 167 013 hectares, is part of the Eastern Afromontane Biodiversity Hotspot and is an Important Bird and Biodiversity Area of international significance. The area is also of cultural and historical significance since it possesses many archaeological and ritual sites.

Like many other biosphere reserves across the world, the Yayu Coffee Forest Biosphere Reserve is classified into different sections: the core zone, the buffer zone and the transition zone (see Figure 2). The core zone represents relatively intact forest, with an abundance of wild coffee and other species that are of significant conservation value. No human intervention is allowed in the core zone. The buffer zone includes locally managed forests used for the production of wild coffee, wild spices and wild honey in the form of semi-forest coffee systems. The transition zone represents an area of the biosphere reserve that is under intensive human use and therefore requires the promotion of sustainable resource use. The transition zone includes agricultural land, grazing land, settlement areas, coffee home gardens, small plantations and some semi-forest coffee production areas.

FIGURE 2 MAP OF THE YAYU COFFEE FOREST BIOSPHERE RESERVE



Source: UNESCO, http://unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/images/img_BR_yayu_ethiopia001.jpg

The wild *Coffea arabica* in the biosphere reserve is a source of household subsistence for over two-thirds of the agriculture-dependent communities in the region. The economic worth of the indigenous populations of wild coffee varieties to the global coffee industry, for example through the potential development of pest- and disease-resistant varieties and high-yielding varieties with low caffeine content, is between \$420 million (ZAR 5.5 billion) and \$1.45 billion (ZAR 19 billion) per annum.⁶ Despite the scientific and economic roles of the wild coffees, the forests harbouring the indigenous populations of the crop are fast disappearing due to anthropogenic factors including climate change, signalling the urgency for coordinated wild coffee conservation action.

The discovery of coal deposits in the coffee forest and the government's plan to extract the coal and produce coal-based chemical fertiliser and coal-fired thermal power has presented the greatest challenge to the existing conservation endeavours in the region. A geological survey by a Chinese-based consultancy firm, China National Complete Plant Import and Export Corporation, estimates the availability of a total of 230 million tons of coal in an area of just 50 km² in and around the forest.⁷ The same report noted that the coal resource can help the country to produce 300 000 tons of urea and 300 000 tons of diammonium phosphate a year for the next several decades, as well as 30 000 tons of ethanol and 90 MW of electrical power. Considering coal's role in substituting fertiliser imports⁸ and contributing to the national economy, the development of the deposit has been promoted by the government as a means of increasing the efficacy of the mining sector, modernising the agricultural sector and boosting its productivity, and thereby making a contribution to the Ethiopian government's growth and transformation goals.

Construction of fertiliser plants commenced in 2011/12 within the transition and buffer zones of the biosphere reserve. Interviews with various conservation experts reveal that some aspects of the coal mining and plant installation are already having social, ecological and economic effects.⁹ In the light of this and of the government's intention to further expand the mining site into the buffer zone and some parts of the core zone, social scientists, conservationists and smallholder coffee producers in the region are increasingly concerned about the social, economic and ecological effects of the extractive industry on the lives of smallholder farmers and their biophysical environment.¹⁰ It is legitimate, therefore, to expect that the future expansion of the coal mining activities, while lucrative in the short term, is likely to devastate an increasingly fragmented and vulnerable forest ecosystem of the region, unless proper mitigation systems are in place.¹¹

SOCIO-ECOLOGICAL EFFECTS OF COAL MINING

In many parts of the world, such as the Democratic Republic of Congo and the western Amazon, the extraction and processing of mineral resources are expanding into biodiversity hotspot regions inhabited by resource-dependent local people.¹² There are at least two major pre-existing competing interests over the resources and spaces of south-west Ethiopia. First, the competing claims and use rights are associated with the historical local use values of the land as an agricultural production space, a source of water for local communities and a symbolic space for undertaking various cultural and religious practices. Second, the competing interest is associated with the state and non-state conservationists' claim on the forestland

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and the biodiversity as a conservation space, which should be completely free from human intervention. Overall, the geographic space claimed by the extractive industry contains valuable biodiversity resources and is a livelihood space that has been used, claimed and administered by various resource user groups, including local communities and conservationists.

As with the political ecology dynamic of the conservation and mining nexus elsewhere, the competing interests over the spaces and resources, fuelled largely by an increasing desire to pursue coal mining, are resulting in a range of undesired socio-ecological outcomes at both a regional and a local scale. At the local scale, the most significant effect of an extractive-led development trajectory is displacement. In south-west Ethiopia, displacement can be understood in two broad ways. The first form of displacement is the physical eviction of thousands of smallholder farmers from their dwellings and properties to make way for coal mining activities and construction of fertiliser factories. The second form of displacement is the expropriation of productive assets. This form of displacement is caused in part by the strict security measures put in place by the mining officials, leading to the restriction of villagers' access to productive agricultural land and wild coffee farms adjoining the mining site. The combined effect of these two types of displacement is that communal and traditional land use arrangements have been disrupted and the local communities have been forced to live with a small plot of productive agricultural space and a severely diminished resource base. The lack of access to productive space and resources has in turn increased the pressure on the reserve, as villagers increasingly enter the protected core zone to collect forest resources.

The site clearing, excavation, levelling, drilling and earthworks involved in coal mining and the construction of fertiliser factories have become a threat to biodiversity resources, the future productivity of the land, and the long-term usability of the local water points. A considerable area of agricultural land and some patches of forest land have been cleared for the construction of mining camps, the fertiliser facilities and other buildings, preparation of dump sites and excavation activities, causing wild coffee extinction and loss of other biodiversity resources. Habitat loss, coupled with the displacement of local communities, has led to the deterioration of the livelihoods of thousands of forest-dependent households. Affected villagers indicate that the provisioning, supporting, cultural and regulating services of the forest are lost and resource-dependent farmers are struggling to obtain wild fruits, farming tools, thatching grasses, wild coffees, and trees for hanging beehives.¹³

Construction of the fertiliser factories and coal mining operations have necessitated the influx of large numbers of unskilled and skilled workers, predominantly from non-local groups. With possible employment opportunities in the mining industry serving as a pull factor, the arrival of this work force has resulted in new forms of power relations and a disruption of existing natural resource use and management systems, which have left local communities with limited power over forest-related decision-making processes. Moreover, the arrival of new groups in the area has increased the competition for housing and livelihood spaces in the area, further exacerbating the pressure on the protected coffee forest.

Given that the coal mining is at an early stage, these and other socio-ecological effects will continue throughout the lifespan of the coal-mining operation, and

will change over time both in terms of the nature of the benefit or the costs and in terms of who benefits or carries the cost. As the 2009 Environmental and Social Impact Assessment (ESIA) study clearly outlines, there will be further alteration of natural resources (vegetation species, soil and land structure), the arrival of new resource user groups and the introduction and discharge into the environment of toxic chemical products like petroleum and ore waste from mines.¹⁴ Therefore, as highlighted in the 2009 ESIA and other previous environmental impact assessment studies,¹⁵ undertaking a continuous geological investigation and designing a comprehensive monitoring system that aims at tracing the extent, severity and magnitude of the social, ecological and economic risks of the mining operation will help in minimising further damage to the environment and the lives of the people who live in it.

BALANCING CONSERVATION AND MINING

Social, political and economic processes involved in extractive industry operations have become triggers for socio-political insecurity and conflict around the world, mainly in fragile states such as Ethiopia. Often, conservationists and local communities tend to reject the 'politically neutral' view of resource extraction and processing as resulting in undesired but easily mitigated social, economic and environmental effects. Instead they favour reframing the discussion over the interrelations between mining and biodiversity as a political process. The political process involves negotiation among actors and making decisions regarding the manner in which the extractive operations affect humans and their environment. In a similar manner, the solution to the coal mining–wild coffee dilemma in south-west Ethiopia is determined to a great extent by the power relations as well as the interests and interaction strategies of the public and private actors involved. Understanding the needs, interests, aspirations and priorities of each of these actors is crucial in designing a harmonised approach to sustainable natural resource use and management and supporting the co-existence of mining and conservation actions in the region. Equally, there is an urgent need to rethink existing biodiversity conservation and resource extraction policies and strategies if Ethiopia is to take concerns of poverty alleviation, biodiversity conservation and economic growth seriously.

As seen elsewhere, mining actors can exert influence on decisions about the location of extractive operations which may be associated with harmful by-products that can, without appropriate control measures, be released into the environment. These environments are, however, often the livelihood base of many local communities and biodiversity hotspots containing species of significant economic worth. For this reason, any planning that has to do with mitigating the possible threats of extractive industries to both the environment and the health and safety of people has to start by paying adequate attention to the social, cultural, economic, religious and political realities at the local scale. It is important to note that prioritising short-term financial returns of the extraction and processing of coal from conservation spaces over the preservation of the wild coffee genetic materials could result in irreversible damage to the region's biological diversity.

In practice, this means that the mining actors within the state structure should think more seriously about the environmental and social concerns that are

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consistently raised by some groups. One of the most important considerations in this regard is the evaluation of whether or not a further expansion of the mining space and operations is necessary for the national economy. This will help the country to identify the short-term benefits and long-term environmental and economic costs to the government as the mining activities continue. In parallel with this, investigating the objects, elements and systems of the environment that will be lost forever or will undergo degradation because of the mining activities, and scrutinising the possible dangers and threats of mining activities to the living conditions of local communities are essential for achieving the goals of sustainable development.

Balancing conservation with mining can also be a possibility if the country pays serious attention to designing and implementing specific activities that are useful for the remediation, rehabilitation and restoration of land areas and other natural features damaged in the course of the mining activity in the region. However, while these activities are vital for ecological restoration in the region hosting the mining operations, the challenging aspect could be determining the timeline and establishing whether or not these activities will actually be implemented on the ground. In this regard, it is necessary to take timely action to ensure that the recommendations of the 2009 ESIA are implemented and also to further develop a comprehensive mitigation plan throughout the subsequent stages of the coal mining operation.

The Ethiopian government should work hand in hand with local communities, environmentalists and civil society groups to promote socio-economic and environmental sustainability through responsible coal mining

Finally, the Ethiopian government should work hand in hand with local communities, environmentalists and civil society groups to promote socio-economic and environmental sustainability through responsible coal mining. Although mining plays a crucial role in building national identity, power generation and fertiliser import substitution for Ethiopia, the purpose of extracting coal should not just be increasing the efficacy of the mining sector and modernising the agricultural sector. Improving the quality of life of local communities, through supporting local development and providing alternative job opportunities, restoring land areas and other natural features, conserving the environment and preserving cultural heritage should all be equally considered.

The Ethiopian government has to carefully weigh the income generated by the exploitation of natural resources against the economic, social and environmental benefits of biodiversity conservation. This requires the coordination of various sectors and services as well as the development of strategies for comprehensive land use planning at a national scale. The government needs to engage with the extractive industry actors to identify opportunities in geospatial planning and biodiversity management systems that allow for sustainable mining and environmental protection. For their part, the coal mining actors have to play an active role in ensuring that their local-scale operations take into account the necessary management measures for safeguarding biodiversity.

CONCLUSION

The impacts of coal mining on both the environment and livelihoods are of particular concern in important landscapes like the Yayu district of south-west Ethiopia. The current environmental impacts from the coal mining operation in the

region appear to be limited in scale and of small significance. However, the plan to further expand mining operations is likely to increase this impact and should not be neglected when discussing the future of this important landscape. In connection with this, there are important phenomena that need to be monitored: the expected growth in population, introduction of advanced mining technologies, acquisition of additional plots of coffee forests, and increase in mining activity.

In future, the government of Ethiopia should continue to explore practical and cost-effective ways of reducing the impact of coal mining on local biodiversity. At a policy level, there are three points that should be carefully considered in order to address the mining-conservation dilemma. First, the government should improve the coherence of strategies across the mining and natural resources governance sector to enhance livelihoods and minimise environmental impacts of coal mining operations. Second, there is a need to harmonise mining policies and biodiversity management strategies as well as promote development policies that stimulate environmentally sound mining practices in the region. Such approaches would assist in tackling conflicting interests between environmental management, economic growth and the mining sector itself. Third, the possible social, economic and environmental effects of the coal mining operations should be re-investigated thoroughly and disseminated transparently before the further expansion of mining concessions is considered.

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Jan Smuts House,
East Campus,
University of the
Witwatersrand

PO Box 31596,
Braamfontein 2017,
Johannesburg,
South Africa

Tel +27 (0)11 339-2021
Fax +27 (0)11 339-2154
www.saiia.org.za
info@saiia.org.za



Jan Smuts House, East Campus, University of the Witwatersrand
PO Box 31596, Braamfontein 2017, Johannesburg, South Africa
Tel +27 (0)11 339-2021 • Fax +27 (0)11 339-2154
www.saiia.org.za • info@saiia.org.za