

Integrated Assessment of Trade-Related Policies and Biological Diversity in the Agricultural Sector in Jamaica:

Transition Strategies for the Sugar Industry

Summary

1 Introduction

The integrated assessment (IA) in Jamaica focused on the changes in trade policy related to the sugar sector and the impact of these changes on the Jamaican sugar industry and on the environment and biodiversity. It involved an analysis of Jamaica's current external trade relations and markets, trade policies, agricultural and energy policies, and environmental planning procedures and regulations. It considers future scenarios and presents policy options to assure future sustainability in the industry. The IA focused on the sugar industry because it is the largest employer of agricultural labour and uses the highest percentage of arable land in Jamaica. It has also been an important part of Jamaica's economy, trade and social fabric for nearly 500 years. However, recent changes in trade policy have exposed Jamaica's inability to produce sugar at competitive prices and left its future uncertain. Its fate has significant implications for Jamaica's environment and biodiversity.

One possible solution is to reorient the sugar industry to supply other key economic sectors, such as supporting energy production. The IA specifically examined the Government of Jamaica's plan to re-focus the sugar industry to produce ethanol. This would lead to an increase in the area of land under cane production but a reduction in the volume sugar produced. The success of this plan, and the future survival of the industry, depends on pending changes in two external trade policies – the Caribbean Basin Initiative (CBI) and the current tariff rate applied to Brazilian ethanol. Success is also contingent upon the future price of oil and on profound restructuring within the industry itself.

An emphasis on biodiversity is important in Jamaica, a country with a wealth of animal and plant species, both terrestrial and marine. Jamaica is ranked fifth among the islands of the world in terms of number of endemic plant species. There is also a high level of endemism for many species of animals, including amphibians, reptiles and land birds. Despite relatively high levels of biodiversity and endemism, a number of species have become extinct over the past 150 years. Jamaica's Conservation Data Centre has indicated that at least 221 endemic species are now classified as 'critically imperilled' or 'especially vulnerable'. Although the Government of Jamaica has designated roughly 16 per cent of its land as 'protected' it faces challenges related to its ability to police these areas. It also faces challenges with respect to maintaining the health of its marine diversity (in particular, coral reefs) and managing rates of deforestation and loss of forest cover and habitats.

Taking biodiversity into account in policy making is vital for a country such as Jamaica, where the economy relies heavily on these resources to support economic sectors including fisheries, agriculture and tourism. Biodiversity also contributes to social well-being and to environmental

health by providing critical ecosystem services that include purifying the air, conserving water, protecting soil, regulating the climate, and protecting coastal lowlands and marine ecosystems from the effects of flash flooding and sedimentation.

2 The context of the integrated assessment

2.1 The sugar industry in Jamaica and its environmental impacts

Sugar cane was introduced to Jamaica by European settlers and, at one time, Jamaica was the world's single largest exporter of sugar. The importance of Jamaica's sugar production on a global scale has declined dramatically, however, and Jamaica now accounts for just 0.1 per cent of the world's output. At the national level, sugar cane and the products derived from it continue to make a worthwhile contribution to Jamaica's economy. The export of raw sugar contributes an average of US\$75 million per year in foreign exchange, which represents roughly 36 per cent of the foreign exchange earnings from agriculture. The sugar industry is also the largest employer of agricultural labour, employing 38 000 people, and it uses 30 per cent, and much of the best, arable land in Jamaica. The sugar estates also contribute to rural communities by providing social services including health, education, and recreation facilities. Any further decline in the sugar industry in Jamaica could have significant negative impacts for social sustainability, unless other industries and crops are developed to take its place.

The production of sugar cane has significant implications for national biodiversity. Indeed, sugar cane has probably caused a greater loss of biodiversity than any other single crop in the world due to the destruction of wetlands for plantations, intensive water use, heavy dependence on agrochemicals, and high levels of wastewater discharged during the production process. Land clearance for cane production not only results in the direct loss of species and habitats, but underlies a range of wider impacts on ecosystem functions, including changes to hydrology and increased soil erosion.

At present, most of the environmental impacts associated with the sugar industry in Jamaica are related to routine operations rather than to expanding the land area under cultivation. The processes involved in producing sugar, from clearing, planting, ripening and harvesting the cane, burning the fields, preparing and milling the cane, and processing the juice to derive the sugar (with clarification, evaporation, crystallization and centrifugation), all require significant inputs of agrochemicals and energy. The associated impacts on land and soil, water and air include the following:

- ***Impacts on land and soil.*** Sugar cane is often cultivated on former wetlands and other fragile ecosystems because it is difficult to grow other crops under these conditions. It tends to be grown as a continuous monoculture crop, requiring a large land area. The impacts of the sugar industry on soil are felt both in terms of soil quantity and soil quality. Soil quantity is reduced as a result of increased levels of erosion, which are caused by conventional tillage practices and cultivation on slopes and in riparian areas. Soil quality is affected through salinization and declining soil health and fertility as a result of cane burning and the excessive use of agrochemicals.

- **Impacts on water.** The impacts of the sugar industry on water are related to both water quantity and water quality. Impacts on water quantity include heavy consumption for cultivation and the over-exploitation of water resources including heavy use of groundwater. Most cane is grown under irrigation and it takes between 1 500 and 3 000 litres of water to produce 1 kilogramme of sugar. Large amounts of water are also used in the milling process to wash the juice from the bagasse.

Water quality is adversely affected primarily by the high levels of agrochemicals used in the production of sugar cane – their runoff pollutes watercourses – and by high levels of siltation. Surface and groundwater can also be contaminated by pesticides and nutrients from fertilizers, which pose a direct threat to biodiversity and to human health. During the transformation of sugar cane into sugar, large volumes of wastewater are discharged at various stages in the process, along with plant matter and sludge, which can cause large-scale fish kills. The discharge of polluted water, which contains heavy metals, oil, grease, cleaning agents and vinasse, is the most significant impact related to the processing of sugar cane. Cane mill effluents tend to be relatively rich in organic matter and the decomposition of this matter reduces the oxygen levels in the water, affecting natural biochemical processes and the species inhabiting those freshwater systems, including plants.

- **Impacts on air.** Impacts on air quality from the sugar industry tend to come from burning the cane fields and emissions in the processing stage, including from energy use. The cane trash is generally burned prior to harvesting and can contribute to substantially elevated levels of carbon monoxide and ozone in the atmosphere. Bagasse is burnt to generate steam for driving mills and turbines, turbo generators for electricity and providing process steam for the concentration of juices. The burning results in airborne emissions and affects neighbouring communities. High levels of energy are used in the clarification process, which involves heating and adding lime, removing the impurities from the juice, and boiling clarified juice to produce molasses. Emissions from these processes include flue gases, soot, ash and other solid substances, along with ammonia, which is released during the concentration stage.

The specific impacts on the sugar industry in Jamaica were identified with the assistance of a case study that examined the Frome Division of the Sugar Company of Jamaica, which is the largest of five government-owned estates. Frome plays an active role in the community, providing health clinics, basic school facilities, recreational facilities and other social infrastructure. It is the largest employer in the parish in which it is located.

The Frome location was once an area with significant coverage of red mangrove, whose root systems provided a permanent habitat for fresh water fish and crustaceans and a temporary habitat for spawning migratory marine fish species. These mangroves have largely been destroyed to accommodate increases in cane cultivation, which has resulted in a loss of marine and bird species. At Frome, the major release of effluents from the sugar factory coincides with the spawning period of the fish in the adjoining watercourses. The area generally provides a viable fishing ground for local fishermen. However, during the peak surge of effluent releases, which lasts for two to three days, virtually all the fish in the streams in the immediate vicinity are

killed by asphyxiation. It takes at least six months to restore the fish population in the area, which has a negative impact on the local fishers. A steady decrease in the levels of fish stocks has been recorded in the area, despite the ability of the fish to repopulate, which means that the long-term viability of the fishery and the biodiversity is in jeopardy. In addition, even though the practice of cane field burning stopped at Frome in 2008, local residents have noted that there is still a regular release of smoke and soot from the boilers and turbines at Frome, and some have complained of respiratory disease.

2.3 Trade-related policies affecting the sugar sector

This IA takes into account several trade-related policies that will have an impact on the future of Jamaica's already globally uncompetitive sugar industry. As a member of the Africa, Caribbean and Pacific (ACP) group of countries, Jamaica has enjoyed long-standing trade preferences with the European Union (EU) under successive Lomé Conventions, commodity protocols, and the Cotonou Agreement, which insulated the Jamaican industry from increasingly competitive non-ACP sugar producers and recent lows in world sugar prices. Under the Sugar Protocol, the EU was bound to import specific quotas of sugar from sugar-producing ACP countries (including Jamaica) at guaranteed prices, which were well above the world market price of sugar.

Further to a decision by the World Trade Organization's Appellate Body, on 1 January 2008, the traditional trade preferences afforded by the EU to the Caribbean (and other) ACP countries were replaced by a single Economic Partnership Agreement (EPA) that was non-discriminatory and reciprocal. The EPA involved the phased removal of all trade preferences established between the EU and the ACP and the progressive removal of trade barriers between the trading partners (although adjustment can occur at different rates). The preferences under the Sugar Protocol, which was enacted in 1975, expired in October 2009. To dismantle the Protocol, the EU phased in price reductions. Jamaica's sugar industry, which was inherently uncompetitive due to high costs of production, depended heavily on the preferences afforded it under the Protocol. It was expected that the reforms would lead to a decline in export revenues of over €20 million annually between 2007 and 2009.

The future of the industry will also be influenced by developments in the CBI, a trade program with the United States that promotes economic development and export diversification of the economies in the Caribbean through preferential tariff treatment. The Caribbean Basin Trade Partnership Act, which requires a waiver from the WTO, will expire on 30 September 2010. One avenue for diversification within the Jamaican sugar industry – the viability of proposed exports of ethanol from Jamaica to the United States – depends largely on the renewal of the CBI. However, in recent years several countries (such as the Dominican Republic and countries in Central America) have negotiated bilateral trade agreements with the United States and it is unclear whether the CBI will be renewed or whether the United States will negotiate new bilateral and regional trade agreements, and under what terms.

2.4 Potential future developments and the Government's policy response

A decline in Jamaica's sugar industry would have important economic, social and environmental implications. The Planning Institute of Jamaica has reported the potential for losses of €24

million per year in foreign exchange export earnings by 2010, with cumulative losses of €184 million between 2006 and 2015. The exit of small cane farmers from the industry could lead to the closure of raw sugar production facilities and increasing levels of rural unemployment. A decrease in producer and household incomes would result in significant reductions in the purchase of capital goods, intermediate goods and loss of government tax revenue. From a social perspective, there could be increasing migration from rural to urban areas, growth in informal settlements, increasing levels of poverty, loss of social benefits provided by the sugar estates and increasing levels of crime and health problems in the areas most affected.

From an environmental perspective there would be a loss of ground cover and a loss of potential for carbon sequestration, as well as increased pressure on the environment from informal settlements and a greater vulnerability of communities to natural hazards. However, there are other land-use options for the former cane fields, some of which could be socially, economically and environmentally positive. Much depends on how the process of change is managed.

In view of this, the Government of Jamaica proposed a plan for the sugar sector to refocus and revitalize the industry. This plan is analyzed in the IA. The plan involves increasing the output of raw sugar (from 200 000 to 300 000 tonnes) and directing a significant portion of cane production from sugar to ethanol production. The aim is to increase the land area under sugar cane cultivation by roughly 13 000 hectares, augment productivity by at least 35 per cent and reduce production costs by over 30 per cent.

3 The integrated assessment

3.1 The process

The IA in Jamaica was implemented by the National Environment and Planning Agency (NEPA), the Government's lead environment and planning body. The national research institution was the Institute for Sustainable Development (ISD) of the University of the West Indies. The ISD's role was to undertake and manage the research. The core team that conducted the project was composed of representatives from these two institutions. Other partners in the IA were represented on the National Advisory Committee and included representatives from government ministries and agencies, the EU, and the private sector.

The IA was conducted with the participation of a wide range of stakeholders involved in the sugar industry in Jamaica. The stakeholders, which included the Government of Jamaica (which owns most of the sugar industry), extended to owners and shareholders of privately owned sugar estates, factory and field workers, independent cane farmers, workers on cane farms, farmer and worker households, residents in sugar-dependent communities, suppliers to the sugar industry, and trade union officials. A stakeholder workshop was held on 15 May 2008 to serve as a national review meeting. In addition, the core team attended three international review meetings, which were organized by UNEP and held in Geneva.

3.2 Methodology

The IA employed the methodology described in the Policy Assessment Manual on Trade, Agriculture and Biodiversity, developed by UNEP in collaboration with the World Conservation Monitoring Centre and the Secretariat of the Convention on Biological Diversity.¹ The approach involved both primary and secondary research. The primary research included a series of interviews and site visits and the secondary research involved an extensive literature review.

The study approached the IA by examining three possible future scenarios associated with reforms to the sugar sector, as follows:

1. The Government's plan to revitalize the sugar industry will succeed.
2. The Government's plan to revitalize the sugar industry will fail.
3. The multifunctional nature of the sugar sector will be optimized through the implementation of policies to achieve economic, social and environmental goals. This scenario was presented to demonstrate a viable future for the sector, taking into account the necessary policies to promote economic prosperity, social well-being and environmental protection, including the conservation of biodiversity.

3.3 Findings

3.3.1 Scenario 1: the Government's plan will succeed

In order for the Government of Jamaica's plan to revitalize and refocus the sugar industry to succeed, several things must occur. To increase the output of raw sugar, increase productivity and reduce costs of production a significant investment would be necessary in new equipment, replanting, and improving management practices. It is possible that it would not be cost-effective to retrofit all factories and some public factories would probably have to be closed. Retraining programmes would then have to be put in place for displaced workers. Adequate funding would have to be secured from non-governmental sources to finance the upgrading and the retraining programmes as the costs exceed the level of funds currently available under the EU's "Accompanying Measures" programme.

In addition to the restructuring and modernization of the industry, for the plan to succeed the trading environment for sugar must remain stable and the trading environment for ethanol must unfold in a very specific fashion. The Government would like to encourage production of ethanol by creating a local market through a requirement that ethanol contribute 10 per cent to Jamaica's gasoline. At present, Jamaica imports the ethanol that it uses for feedstock from Brazil. The Government would like to replace these imports with locally produced ethanol. However, it is unlikely whether production of ethanol in Jamaica would be able to compete with Brazilian ethanol. Brazil is the world's largest and most efficient producer of ethanol. Brazilian investment in Jamaica's ethanol industry depends on existing trading arrangements and tariff structures.

The United States is the world's largest consumer of ethanol. At present, it maintains a tariff on imports of ethanol from Brazil. Under the trade preferences in the CBI, the United States allows imports of ethanol from Jamaica to enter duty free. As a result, some Brazilian investors

¹ The IA was developed using the draft manual (June 2007) with the working title "Incorporating Biodiversity into Integrated Assessment of Trade Policies in the Agriculture Sector."

expressed an interest in buying a large part of the industry in Jamaica. Their business plan was to supply Jamaica with raw ethanol from Brazil, de-water it, and blend the finished product in Jamaica and then export it from Jamaica to the United States. For this to work, the United States must renew the CBI and continue to maintain high tariffs on Brazilian ethanol. Both of these outcomes are uncertain. Without the existing trade measures in place, it would be cheaper for Brazil to export ethanol directly to the United States, rather than to invest in Jamaica's industry. The business plan depended on arbitraging the differences in tariffs and was, therefore, extremely speculative.

Intensification in the industry will increase the environmental load with respect to impacts on soil, rivers, coastal waters, reefs, freshwater and marine species and air quality. However, closing old plants that operate under poor management could have positive impacts. To the extent that these plants are replaced by modern factories, employing state-of-the-art technology and good management practices, and that those would be subject to effective regulations, the net environmental impacts of the plan could be positive.

Additional hectares under cane production would be required to increase ethanol production. To the extent that this additional land is taken from cane land that was already under cultivation for sugar production, the impacts on biodiversity of producing cane for ethanol would be relatively insignificant. To the extent that any virgin lands are placed under cane production, the environmental impacts, and in particular the impacts on biodiversity would be much greater. The modest displacement of carbon emissions represented by a move to ethanol-blended gasoline represents a minor environmental gain.

3.3.2 Scenario 2: the Government's plan will fail

The second scenario for the future of the industry is that the Government of Jamaica's plan will not succeed. If the plan was to fail, the public estates and mills, which are the least efficient operators, are unlikely to survive. The private estates that produce rum could remain viable, and might involve the purchase of inputs of raw sugar from cheaper suppliers, such as Brazil. However, the remaining sugar-producing estates would probably cease production and former cane land, along with land that is currently planted with cane, would either remain idle or would be converted to another use.

If the sugar industry in Jamaica were to disappear over time, there could be an associated improvement in water quality and in marine and freshwater biodiversity. Whether or not these gains are lasting would depend on the alternative uses of the former land under sugar cane production. Much of this acreage is located inland and would likely be converted to housing developments or small-scale farms. If the transition is not managed effectively, there is a danger that land could also be occupied by squatters, leading to environmental concerns related to sewage and waste disposal. On the other hand, converting former cane lands into forestry projects could have positive environmental impacts for biodiversity, soil and watershed management. If the Government's plan was to fail, there does not appear to be a contingency plan in place to manage the transition of the former sugar cane lands to ensure their future sustainability.

3.3.3 Scenario 3: a viable future for the industry through policy intervention

The IA's third scenario was presented with the aim of proposing a way forward to achieve a range of goals. These included energy security and food security, and moving away from extensive, low-value forms of agriculture towards intensive, high-value forms of agriculture that have the potential to increase revenues, profits and levels of skill transfer, while reducing environmental impacts.

In recent years, the rising cost of oil exposed Jamaica's vulnerability to price fluctuations. The country relies on imported oil to meet 95 per cent of its energy requirements. Rising oil prices have negative impacts on Jamaica's balance of payments and competitiveness. In 2008, the increased price of staple foods highlighted the need to emphasize food security and the importance of local food crops. This is in addition to concerns related to access to, and the affordability of, imported food which can, in part, be addressed through lower tariff barriers.

To address issues related to energy and food security, along with long-term sustainability and conservation of biodiversity, and the health of rural communities, the third scenario proposed a focus on the managed, partial diversification of sugar cane lands into a combination of higher-value uses. These uses include:

- increasing levels of agro-processing to produce value-added agricultural products and plant extracts;
- converting former sugar cane lands to produce local alternative complex carbohydrates that could mitigate dependence on imported staples (such as wheat and rice) and improve food security;
- undertaking mixed development projects that could include agriculture, housing, light industrial plants and green spaces;
- pursuing a bio-fuel strategy that focuses on third-generation solutions (such as algal biodiesel) that do not place such high demands on land or water as the cultivation of sugar cane and can help address issues related to energy security in the future; and
- developing and diversifying the tourism sector, including conventional tourism, ecotourism, heritage tourism and health and retirement tourism.

It is expected that a transition away from the intensive cultivation of sugar cane would result in significant gains for air quality, water quality and for biodiversity.

4 Policy recommendations

The IA found that serious data gaps exist with respect to Jamaica's biodiversity, despite preliminary work that has been done by the University of the West Indies. A key recommendation made was to develop a more extensive set of bio-indicators to inform future policy decisions. The IA report presented a full set of indicators that should be monitored in order to continue to take the environment and biodiversity into account in policy making. This set of indicators could form the baseline for any future work in this area.

To achieve the specific outcomes from the third scenario, the IA proposed that several regulatory and legislative gaps also be addressed. These gaps, and the measures that should be taken to

address them, are identified in the policy recommendations. They include, in the first instance, cross-cutting educational, technical, institutional and legislative components.

Educational and technical	<ul style="list-style-type: none"> • Develop a strong and transparent policy processes with clear priorities and measurable goals. • Develop the technical capacity in institutions to undertake <i>ex ante</i> and cross-disciplinary analysis. • Improve understanding among stakeholders and policy makers of the implications of trade liberalization. • Develop a credible database of indicators of biodiversity.
Institutional and legislative	<ul style="list-style-type: none"> • Enforce environmental laws, strengthen commitments to implement plans and policies, resolve policy conflicts and increase cooperation among government departments. • Enforce environmental regulations with sanctions strong enough to deter infractions; introduce environmental life-cycle auditing and management; strengthen legislation on biodiversity protection; and develop incentives for activities that support biodiversity. • Provide incentives for the adoption of cleaner technologies in production. • Strengthen agricultural extension programmes, support the development of sustainable non-traditional forms of agriculture; reallocate unused former cane land for forestry. • Reassess the National Strategy and Action Plan on Biological Diversity in Jamaica and address gaps; develop capacity for conservation of protected areas as outlined in Jamaica’s National Ecological Gap Report. • Amend the Constitution of Jamaica to ensure indefinite support for biodiversity conservation and sustainable use of biological and genetic resources. • Amend the Watershed Act to ensure the conservation and sustainable use of wild flora and fauna. • Amend the Wild Life Protection Act to give stronger protection to plants, invertebrates and microorganisms. • Strengthen protection for key ecosystems, such as rivers, coastal areas, wetlands, coral reefs, cays, and caves. • Increase awareness by the judiciary of the status and value of Jamaica’s biodiversity, especially threatened species, so that appropriate fines are applied. • Develop new sanctions based on the “polluter pays” principle.

The IA demonstrated that the fate of the sugar industry has significant social, economic and environmental implications in Jamaica. The success of any strategy will be measured in terms of its ability to achieve broad goals related to economic growth, energy requirements, social well-being, environmental protection and the conservation of biodiversity.

From an economic perspective, this involves stemming losses in the industry, generating export revenues and creating employment. With respect to energy use, it involves reducing dependence on imported oil, increasing supply from renewable and/or low-carbon sources and reducing carbon emissions. From a social perspective, it includes reducing the spread of informal settlements, increasing the percentage of the population with adequate housing and land title, reducing the rate of violent crime, reducing poverty and improving health. Finally, from an environmental perspective, it concerns reducing pollution caused by agrochemicals and silt in inland and coastal waters, improving the health of coral reefs, reducing air pollution and rates of soil erosion, restoring populations of endangered species, expanding tree cover and increasing levels of carbon sequestration.

In order to achieve these goals, several policy recommendations were proposed, which are presented below.

Socio-economic	<ul style="list-style-type: none"> • Assess the potential contribution of economic incentives to promote the sustainable use of biodiversity. • Actively engage communities in the planning phase of development projects. • Addressing existing environmental problems in the communities. • Explain the role of biodiversity management in poverty alleviation, and the social services provided by the environment. • Develop alternative (and less damaging) livelihoods in rural communities. • Expand agricultural extension services to farmers, particularly modern farming techniques.
Freshwater resources	<ul style="list-style-type: none"> • Support research to ascertain the nature and extent of threats to freshwater resources. • Enforce regulation with regard to the monitoring and control of effluent released into rivers and inland water bodies. • Implement water management strategies to conserve freshwater biodiversity. • Promote public awareness of the importance and value of freshwater ecosystems. • Monitor and regulate the harvesting of freshwater resources.
Coastal and marine resources	<ul style="list-style-type: none"> • Monitor developments and enforce regulations to prevent the destruction of species, especially those already endangered. • Develop stronger planning mechanisms to prevent sensitive habitat destruction and the loss of threatened species. • Develop and implement recovery plans for threatened species. • Build comprehensive databases and develop the information and knowledge systems needed to manage coastal and marine resources. • Develop programmes to reduce sediment and nutrient flows into rivers and coastal waters.
Forest biodiversity	<ul style="list-style-type: none"> • Protect Jamaica's remaining forests. • Increase public understanding of the habitat needs for non-harvested forest species to ensure their conservation. • Increase public understanding of the roles and values of forest resources for biodiversity conservation, watershed protection and carbon sinks.
Water quality	<ul style="list-style-type: none"> • License and monitor the facilities that discharge municipal and industrial effluents into rivers and streams. • Enforce the regulations that control the import, transportation, manufacture use and disposal of hazardous substances. • Establish community groups to address water pollution issues (including 'adopt your local river') and develop water pollution control plans. • Establish additional protected areas to conserve species and their habitats. • Secure the financial resources and expertise needed to develop and implement recovery plans for threatened species. • Enforce the legislation controlling the harvesting of species and habitat protection. • Establish incentives for the conservation and protection of wildlife to prevent species from becoming threatened. • Build databases and develop knowledge of the ecology, taxonomy and status of species. • Increase public awareness of the need for conservation and sustainable use of wild flora and fauna.
Agricultural sustainability	<ul style="list-style-type: none"> • Develop and implement agricultural policies and planning systems based on sustainable use of resources. • Integrate agriculture policies and programmes with conservation policies and

	<p>programmes.</p> <ul style="list-style-type: none"> • Develop land-use zoning and control and enforcement measures to protect sensitive landscapes and species from damaging use and development.
Land-use planning and environmental assessment	<ul style="list-style-type: none"> • Prevent the growth of squatter communities, uncontrolled or poorly planned human settlements in unsuitable areas, including steep hillsides and watersheds. • Prevent the development and expansion of farming on steep slopes and on low-productivity land. • Prevent further deforestation and the destruction of watersheds and wetlands. • Establish incentives for private landowners to conserve biodiversity. • Improve the environmental impact assessment (EIA) process to provide stronger protection for flora, fauna and habitats, with special regard to threatened species and ecosystems; monitor construction to ensure that EIA conditions are actually followed.

The project team identified key challenges facing the IA, notably the fact that much of the discussion to date has been dominated by proponents of the sugar industry, and there were several key gaps in the data necessary to fully assess the scenarios in the IA. Although the results of the IA were not available in time to influence the Government’s initial plan, the findings could have an impact in the future if that plan does not succeed. Indeed, the IA could play an important role to support future scenario planning that takes into account the full range of dimensions and allows for the consideration of a complete set of possible future outcomes for the industry.

Notwithstanding the challenges associated with the project, this was the first IA undertaken of Jamaica’s sugar industry, despite the many studies that exist in the sector. No other report has integrated the social, economic, political, historical, trade-related, technological and environmental issues related to sugar production. Specifically, the IA allowed for a greater insight into the application and use of IA methodologies, a deeper understanding of the problems facing the sugar industry in Jamaica, and the creation of new networks for research and collaboration among academics and professionals in the sugar industry.