

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

Impacts of liberalization in the cocoa sector

Summary

1 Introduction

The integrated assessment (IA) in Cameroon focused on the impacts of the liberalization of the country's cocoa sector on sustainable development (economic, social and environmental variables) with a focus on biodiversity. The specific policy considered in the IA was a national law – Law N°2004/025 of 30 December 2004 – that promoted liberalization of the country's cocoa sector. At the time that it was implemented, no consideration was taken of potential impacts on sustainability, and in particular, on the environment and biodiversity.

Because of its extensive use of land, the production of cocoa in Cameroon has an important relationship with the environment and biodiversity. Most cocoa in Cameroon is produced on small family plots. Cameroon ranks fifth among African countries with respect to levels of biodiversity. Although the country includes roughly 90 per cent of all ecosystem types found in Africa, the forested areas are biodiversity 'hot spots' with an exceptional richness of species. In some areas they are threatened by deforestation, which is driven by the expansion of both traditional agricultural production and cocoa plantations.

The conservation of biodiversity has become a major preoccupation for the Government of Cameroon, which has recognized the high value of ecosystem services. A legal framework has been established to address concerns about the protection of the environment and the conservation of biodiversity and plans have been made to protect 30 per cent of national territory. This conservation effort can contribute to future opportunities for income generation through, for example, encouraging tourism.

The Government of Cameroon has adopted three strategic objectives to promote the conservation of biodiversity:

- i) To reduce the degradation of ecosystems and reverse degradation that has already occurred through management systems which are appropriate for the environment, socially beneficial and economically viable.
- ii) To promote the value and importance of biodiversity, using incentives to help preserve biodiversity and promote the sustainable use of resources.
- iii) To implement biodiversity conservation plans with appropriate planning and follow-up with all relevant stakeholders.

2 The context of the integrated assessment

2.1 Cocoa production in Cameroon and its relationship to biodiversity

Between 2003 and 2007, the cocoa sector annually contributed between 0.89 per cent and 1.45 per cent of Cameroon's gross domestic product and accounted for between five and 9.65

per cent of annual total export revenues. Cocoa production grew from 75 000 tonnes in 1961 to approximately 125 000 tonnes in 2000. Cameroon now produces 180 000 tonnes – five per cent of global production – and ranks fifth in the world in terms of cocoa production.

Most cocoa beans are exported raw with no value added through processing. A small amount is partly or wholly transformed into paste, butter, powder or chocolate. Between 1992 and 2007, the total export value of transformed cocoa was 24.3 per cent of the total value of exports of raw beans. Despite fluctuations, however, the production of processed products, such as cocoa butter and chocolate, has been increasing steadily.

In Cameroon, cocoa is grown in either intensive or extensive production systems, or in a combination of the two. Cocoa is produced almost exclusively by family units and there are between 400 000 and 600 000 cocoa planters in the country. Cocoa production is labour intensive and requires a substantial portion of available manpower in the production areas. The lack of available labour has led to the employment of children. It is estimated that 4 000 children under the age of 15 are involved in pesticide application while 19 000 others work in land clearing and tree pruning.

The impacts on the environment and biodiversity vary according to systems of production such as, *inter alia*, whether cocoa is grown in extensive or intensive production systems, and whether it is grown in direct sun or as a shade-grown crop. In extensive cocoa production, very large areas are cultivated and soil productivity is not optimized. The plantations are often created by cutting down large areas of forest. In Cameroon, cocoa is grown predominantly in agro-forestry plantations under shade. This is in sharp contrast to many parts of West Africa where cocoa is grown as a monoculture crop in direct sun.

Cocoa agro-forestry systems are relatively sustainable and can actually promote the conservation of biodiversity. These systems evolved in Cameroon from the traditional practice of planting cocoa plants under the shade of other trees, and over the time has resulted in agricultural systems that mimic a natural forest, including cocoa plants alongside other species. This shade-grown cocoa encourages a higher level of biodiversity than conventional plantations because other trees and forms of vegetation are allowed to grow in and around it. The agro-forestry ecosystems provide habitats for animals and bird life, and some produce fruits that can be consumed. They also provide corridors that reduce habitat fragmentation and offer opportunities for carbon sequestration. In addition, the agro-forestry systems are also the source of wood and non-wood products which serve a variety of purposes, such as providing food, medicine, construction materials and industrial applications. The wealth of plant and animal species that exist in natural ecosystems (non-agricultural biodiversity) and cultivated spaces (agricultural biodiversity) can be harvested and sold as a source of income for commercial operators as well as local populations.

2.2 Liberalization of the cocoa sector and Law No°2004/025 of 30 December 2004

Before the late 1980s, the cocoa industry in Cameroon was strictly controlled by the government, which attempted to stabilize farm incomes by setting an annual purchase price for raw cocoa. This system collapsed during the 1986-1987 season when prices fell on international markets and the government was unable to stabilize the market using its traditional support systems. The international agreements, which attempt to stabilize income for producers, have proved ineffective, primarily because of overproduction. The cocoa industry needed to be reformed and restructured and price controls needed to be removed.

In Cameroon, the Sixth International Cocoa Agreement, which came into force in 2003, inspired the adoption of Law N°2004/025 of 30 December 2004 that liberalized the country's cocoa sector. The law addressed issues *inter alia* related to product quality and the promotion of cocoa-based products and their derivatives, as well as the collection, analysis and dissemination of data.

In conjunction with its Law N°2004/025 of 30 December 2004, the Government, through the *Ministère de l'agriculture et du développement rural* (MINADER), developed a new agricultural policy, including a 're-launch' strategy for the cocoa sector to increase annual cocoa production to 320 000 tonnes by 2015. The strategy also included provisions to ensure that future production complies with international quality standards as well as EU sanitary and phytosanitary (SPS) standards for pesticide residues.

The re-launch campaign was designed to promote more intensive production in both existing and new areas under cultivation and to expand the amount of land under production. Actions were taken to counteract the aging process of the plants and loss of productivity on existing plantations and to open up new areas to cocoa production and to agriculture generally. The Government provided direct and indirect support to farmers to meet the necessary SPS standards for export. Indirectly, the law encouraged the expansion of cocoa plantations, by increasing the prices paid to producers and by helping to stabilize their incomes. Because of ready access to land and labour, this increasing production occurred primarily through the expansion of cocoa plantations.

Cameroon has several advantages that helped contribute to the successful re-launch of the cocoa sector. These include an abundance of available land, low-cost production processes, knowledgeable producers and skilled employees, and well-organized networks for primary processing and external trade.

3 The integrated assessment

3.1 The process

The IA in Cameroon was coordinated by the *Ministère de l'environnement et de la protection de la nature* (MINEP), the national focal point for all environmental issues and agreements. The national research institution designated to lead the research in the project was the *Centre d'étude de l'environnement et du développement au Cameroun* (CEDC), an inter-university institution specialising in research and training related to the environment and development. Several other government ministries were involved in the IA. These included the *Ministère des forêts et de la faune* (MINFOF), the *Ministère du commerce* (MINCOMMERCE), the ministry with the primary responsibility for trade, MINADER, responsible for government programmes related to agriculture, and the *Société de Développement du Cacao* (SODECAO). Researchers from the *Institut de recherche agricole pour le développement* (IRAD), under the *Ministère de la Recherche Scientifique et de l'Innovation* (MINRESI) also contributed to the project. In addition to ministries and research institutions, the IA involved several development organizations, producers, non-governmental organizations and civil society organizations, including cocoa cooperatives and unions.

In early 2007, a National Steering Committee (NSC) was established that included members from the ministries involved in the IA, the CEDC, the *Conseil interprofessionnel du cacao et*

du café (CICC), SODECAO, international organizations and NGOs including the United Nations Development Programme (UNDP), the International Union for the Conservation of Nature (IUCN), the World Wide Fund for Nature (WWF), the Netherlands Development Organization (SNV) and the *Centre Régional d'Enseignement Spécialisé en Agriculture* (University of Dschang-CRESA). Representatives from the unions of cocoa producers were also included. The NSC met twice in 2007 and twice in 2008.

The project was launched at a workshop on 6 March 2007. This was followed immediately by a Capacity Building Workshop that aimed to improve the understanding of the most relevant stakeholders of the environmental, social and economic impacts of trade policies, with particular focus on biodiversity impacts. Throughout the project, discussions here held with members of the NSC and draft reports were shared and reviewed to ensure that the final report reflected the collective vision of the major participants in the project. The project also benefited from the input of international experts, and members of the core project team participated in the three International Review Meetings that were organized by UNEP and held in Geneva.

3.2 Methodology

The IA examined the elements of the strategy to ‘re-launch’ of the cocoa industry following the liberalization of the sector, in view of social, economic and environmental impacts with particular attention paid to impacts on biodiversity. The IA was conducted *ex post* and was used to identify measures that promote the positive impacts while mitigating the negative impacts of liberalization. The IA used the concept of ecosystem services to frame its assessment of the impacts of liberalization on biodiversity.

The methodology employed several steps. A conceptual framework, inspired by the Millennium Ecosystem Assessment, was developed to better understand the links between trade policies and biodiversity in the cocoa sector. It illustrated avenues linking the Law N°2004/025 of 30 December 2004 to cocoa production, biodiversity, ecosystem services and the well-being of producers. Based on these linkages, several indicators were identified to focus the analysis. The indicators employed to identify social, economic and environmental impacts were not quantified, but the analysis provided an improved understanding of key issues related to sustainability and biodiversity in Cameroon’s cocoa sector. The identification of indicators will also be useful for future data collection efforts and future assessments.

Data collection relied on both primary and secondary sources. A review of the extensive literature available was undertaken to explore various themes related to the cocoa sector. In particular, the review focused on institutional, legislative, socio-economic and environmental aspects of the cocoa production. In addition, primary data was collected from producers to establish a clear picture of the ‘reality on the ground’. As a whole, the cocoa sector is diverse and the strategies put in place by the producers to respond to liberalization and to achieve their production objectives vary from one location to another. During the first half of 2008, the project team collected information from producers in cocoa-growing areas of the country. In total, 74 plantations were visited and their owners interviewed.

Several tools were employed to analyse the data and information gathered. A causal chain analysis was undertaken to identify the cause-and-effect relationship between the liberalization of the cocoa sector and its impact on economic, social and environmental

indicators. A matrix of impacts and a conceptual framework were developed, which were employed to identify specific linkages between the Law N°2004/025 of 30 December 2004 and ecosystem services, biodiversity and the well-being of the population.

3.2 Findings

The main goal of the liberalization was to advance the restructuring of Cameroon's cocoa sector so it would become more competitive on international markets. Liberalization was introduced following an economic crisis that exacerbated the international imbalance between production and consumption in the cocoa sector. A balance was re-established after the devaluation of the FCFA currency, allowing for the continued export of cocoa.

3.2.1 Economic impacts

The impact of liberalization on cocoa production manifested itself in two main phases. During the first phase following the liberalization, there was a general decline in production, productivity, quality and price, which resulted in the abandonment of several plantations. The downturn in the cocoa sector coincided with the removal of national subsidies on agrochemicals, such as pesticides and fungicides. Consumption of these inputs fell sharply and production techniques were modified to account for the change.

Following the re-launch, national production levels increased, rising from an annual average of 86 315 tonnes between 1991 and 1994 to an average of 187 000 tonnes in 2006-2007. Prior to the re-launch, the increasingly poor quality of beans exported from Cameroon had led to a drop in demand for Cameroonian cocoa on the international market.

In conjunction with liberalization in the sector, producers began to organize themselves more effectively to buy inputs and sell production. The revenues derived from cocoa production are a function of quantity, quality and price. With liberalization, the area under production increased, as more cocoa producers entered the sector and, notwithstanding the brief slump that had immediately followed the reforms, cocoa production, quality, and price began to increase.

As production and prices have risen, so has the production of, and revenues from, shade-grown coffee in Cameroon. Shade-grown cocoa and agro-forestry products make a significant contribution to Cameroon's gross domestic product. Shade-grown cocoa is valued for its high quality and the higher environmental value associated with its production. The agro-forests common to shade-grown cocoa production also allow producers to generate cash from the harvest and sale of other wood products, as well as non-wood forest products.

The economic analysis reveals that all systems of agriculture involving the cocoa tree or subsistence crops are profitable. The system of production, which uses cocoa trees with shade-providing fruit trees on short-term fallow, is one of the most diversified and environmentally sustainable.

3.2.2 Environmental impacts

The increase in cocoa production has been achieved with an intensification of production and an expansion of the production.

Extensification. In terms of land use, the size of existing plantations increased after the government initiated its efforts to re-launch the cocoa sector. Changes in land use have had an impact on biodiversity both within and outside of the cocoa plantations. As larger plantations are established, the risk of biodiversity loss increased. There were higher rates of forest conversion, with new plantations accounting for 78.7 per cent of the new areas of production. This trend has had a negative impact on biodiversity, especially in frontier regions. Areas previously covered in forests have become agricultural land. In some regions, this is adversely affecting the delicate biological transition from forest to savannah. In other cases, existing agricultural land and fallow land has been converted to cocoa production.

There has been a systematic elimination of species that are deemed to be incompatible with cocoa farming, and their disappearance represents a loss to the forest ecosystems. In one forest adjoining a plantation, 71 species of trees were counted. Within the plantation, there were only 44 species, of which nine were introduced fruit species. The removal of plant species from the plantations presents the risk that some will disappear altogether in some areas of the country. On average, local cocoa varieties comprise 75 per cent of all cocoa plants in plantations; hybrid species comprise the remaining 25 per cent of cocoa plants.

The increasing number of smallholder plots (growing cocoa and other agricultural crops) has led to a serious fragmentation of habitat. This in turn has led to a significant reduction in the number of endemic species, especially birds.

Intensification. Where production has been intensified, the environmental impacts depend on the production practices employed. Generally, in intensive cocoa production, farmers seeking to optimize production often rely on the intensive use of production inputs, including labour and the application of agrochemicals. Over the long term, these intensive farming techniques can cause imbalances of important nutrients in the soil. Leaves from the cocoa plants (at various stages of decomposition) and the shells of cocoa beans are two low-cost sources of soil nutrients that can counterbalance this threat.

Following the liberalization, producers no longer received subsidies to purchase inputs such as pesticides. As a result, the use of pesticides dropped as farmers found substitutes and employed plant-based pesticides. Such practices have been employed in southern Cameroon where extracts from fermented bark and leaves are used by cocoa farmers as alternatives to chemical pesticides. This avoids toxic residues on cocoa trees and environmental contamination. Of the producers surveyed for the IA, 62 per cent in the central and southern regions of Cameroon said they were familiar with traditional plant-based pesticides.

Liberalization has helped reduce the levels of environmental contamination and the risk to human health of chemical pesticides. However, the IA notes that it is important to ensure that increasing production does not result in the increased use of agro-chemicals as their relatively high cost could be offset by improvements in productivity. Moreover, the IA also notes that while plant-based processes avoid the use of chemicals, they can threaten the viability of the source plants and must be carefully managed.

Promoting biodiversity and agro-forestry. Liberalization was accompanied by the promotion of higher levels of agro-biodiversity. The need for seedlings and the use of other agricultural species in cocoa plantations increased following the liberalization.

There are further opportunities to increase agro-biodiversity through agro-forests, which has been found to be the most profitable form of cocoa production and one that can contribute to the conservation and sustainable use of biodiversity. Cocoa agro-forests have higher rates of biodiversity, improved erosion control and higher levels of carbon sequestration than most other agricultural ecosystems. In Cameroon, increased levels of erosion were observed immediately following the establishment of cocoa plantations, but once they had been established and the canopy was closed, erosion was drastically reduced in the shade-grown cocoa producing areas.

The IA also noted that in Cameroon forests absorb 275 tonnes on average of carbon per hectare. Mature cocoa plantations sequester 65 per cent of the carbon absorbed by a primary forest. Cocoa agro-forests also have the potential to reduce levels of environmental contamination associated with cocoa production.

3.2.3 Social impacts

Over 90 per cent of households in the cocoa producing areas of Cameroon depend on cocoa for their income. Growth in income depends on the price, the quantity produced, and the quality of the cocoa. A gradual increase in price and quality following liberalization led to higher revenues, improved employment opportunities and led to higher living standards. The IA suggests that the re-launch of cocoa production and the Government's efforts to increase production translated in to important opportunities for employment and the potential for improved living standards.

In addition to providing stable jobs, growing employment is positive for the sector for several reasons. When jobs are scarce, there tends to be high levels of migration from rural to urban areas. Moreover, as migration increases, fewer people are left to work on the relatively labour intensive cocoa plantations which can lead to an increase in levels of child labour.

Growth in shade-grown cocoa and agro-forestry products also provides a stable income for producers and contributes to the well-being of local communities. It is worth noting that cocoa plantations use most agricultural land in Cameroon, and increasing the proportion of land dedicated to cocoa production could have negative impacts on food security if land is taken away from the production of food crops. Moreover, increasing deforestation and habitat fragmentation and the negative impacts on biodiversity could threaten food security for rural populations. Wild game provides 90 per cent of the protein for rural populations living in forested areas.

3.2.4 Conclusions

The Government of Cameroon has as its objective achieving a production volume of 320 000 tonnes per year by 2015. The liberalization itself did not address issues related to the environment or sustainable development and was not accompanied by any policies designed to reduce the shock of restructuring on cocoa producers. How that increased production occurs, and the policies that could accompany it, will dictate the environmental and biodiversity impacts associated with the cocoa sector in the future.

Achieving the Government's production goals will necessitate the creation of over 100 000 hectares of additional cocoa plantations if yields are not improved. This extensification would continue to encourage deforestation and loss of agro-biodiversity. On the other hand, cocoa

agro-forests in Cameroon have been shown to have an important potential to conserve agro-biodiversity and biodiversity generally and play an important role in regulating environmental media such as soil and air. Already profitable, increasing production through these systems could also help increase the value of the product among environmentally and socially conscious consumers where appropriate policies are put in place.

4 Policy recommendations

4.1 Options to mitigate negative impacts and promote positive impacts

The analysis in the IA was oriented towards identifying measures that could be put in place to limit the negative impacts of liberalization and promote the positive impacts. Several options were identified that could be applied in the context of the ‘re-launch’ of production in the cocoa sector. Options related to sustainable production and reinforcing the functions of cocoa-based ecosystems are presented in Table 1.

Table 1: Options for the re-launch of production in the cocoa sector

Options for sustainable production	Options for reinforcing the functions of cocoa-based ecosystems
<ul style="list-style-type: none"> • recognizing cocoa as a strategic crop; • organizing producers; • implementing measures to improve production, productivity and quality; • effectively applying international agreements through enhanced public sector involvement; • improving the sector’s regulatory framework and governance structure as well as its financing; • conducting research to increase production efficiency; • developing local capacity for transforming cocoa beans; • improving the use of cocoa by-products; • reinforcing the framework for consultation; and • disseminating information. 	<ul style="list-style-type: none"> • intensifying (rather than extensifying) the production of cocoa in a way that assures the conservation of biodiversity; • promoting cocoa agro-forestry; • optimizing the collection of both wood and non-wood forest products; • legislate and enforce regulations to ensure sustainability rather than the over-exploitation of resources; • regulating pesticide use, taking into account a balance of chemical pesticides with those developed from plant extracts; • maximizing the use of biomass in fertilizer applications; encouraging the raising of farm animals for food; • offering assistance in the management of revenues; and • improving access to land.

4.2 Policy recommendations

The IA presented policy recommendations specifically related to the cocoa industry and to trade as well as recommendations aimed at mitigating negative impacts of liberalization and promoting positive ones.

Reinforce the capacity of institutions related to professional and agricultural training. It is vital that producers are aware of impacts of cocoa production on sustainability, and of the possible means for mitigating negative impacts. At present, institutions are not training future farmers to produce cocoa sustainably. Specific training programmes should be developed and

supported to transfer knowledge regarding sustainable production to producers and other professionals engaged in the sector. Focus should be placed on principles of agro-forestry. The training should ensure that the agricultural engineers, technicians, extension workers and others who complete these programmes have the necessary skills to properly manage natural resources and biodiversity in conjunction with cocoa production.

Take biodiversity into account in zoning and land-use planning policies. Zoning and land-use planning policies should take into account the wider environmental context in which cocoa farms exist, and how they affect watersheds and agro-ecological zones, for example. Policies related to biodiversity in cocoa production zones should be developed. Special attention should be paid to production that occurs on environmentally fragile land, such as near towns and cities, and where plantations threaten to expand into virgin forests or into the transitional zones between forests and the savannah. Land-use planning and zoning should target the protection of wild and rare species and encourage sustainable agricultural production and the preservation of natural ecosystems.

Promote a sustainable and equitable cocoa economy through agro-forestry. The production of cocoa in agro-forestry systems can result in higher prices for the cocoa produced. Therefore, the promotion of cocoa agro-forestry helps assure a sustainable income for the producers. Buyers are willing to pay a premium for a product that is produced in a more environmentally sustainable manner. In addition to cocoa, there are several traditional wood and non-wood forest products and agricultural products in agro-forestry systems that can be gathered and sold, along with a rich animal and bird life. Cocoa agro-forestry systems have remained profitable despite the crisis in the cocoa sector because of these additional sources of income available to producers. However, levels of investment in cocoa agro-forestry systems are still low compared with investments in traditional production systems or forestry projects.

Develop labelling and certification. Trade in goods at the global level has long been subject to SPS standards. Today, some trade is subject to additional standards related to fair trade and organic production. Modern consumers are better informed and are often prepared to pay a premium for goods that are produced in ways that respect basic human rights and the environment. They are also prepared to support goods that contribute to poverty reduction, the 'rational' use of natural resources, and improved living conditions in economically vulnerable communities.

To exploit the market related to fair trade and sustainable production, cocoa producers in Cameroon and in other parts of Africa should encourage stakeholders, such as government agencies, industry associations and consumers to support producers who manage ecosystems sustainably. One model to consider is in Latin America where commercial systems exist to support the fair trade and organic markets for coffee and cocoa. In Cameroon, there is an opportunity to exploit the market for sustainable products in light of the cocoa agro-forests in the South of the country, which are among the most sustainable production systems in Central and West Africa. It would be useful to develop a label or a certification plan for cocoa produced in these agro-forestry systems.

Developing this recommendation requires specific actions, including the following:

- developing environmental standards specifically related to cocoa agro-forestry systems;
- achieving a consensus on a list of inputs allowed to fertilize the soil and protect the cocoa trees from pests and disease;

- developing measures to encourage the import or production of necessary inputs;
- exploring the potential for labelling or group certification; and
- encouraging a transition from traditional cocoa agro-forestry to more sophisticated systems of sustainable production, such as organic cocoa production.

At the global level, a policy encouraging the production of cocoa in an environmentally friendly manner could be put in place. Concepts such as the Protected Designation of Origin (PDO), Protected Geographical Indication (PGI) and Traditional Speciality Guaranteed (TSG), as well as the label for cocoa produced in agro-forestry systems, are tools that could be developed within a framework of policies to improve the quality of cocoa production.

Access to the EU remains an obstacle for cocoa from Cameroon because of restrictions that exist on imports of refined cocoa products. Some producers in Cameroon are experimenting with Asian refiners to expand markets for raw cocoa beans and to increase the sale of value-added products to new markets.

Participate in the Kyoto Protocol's Clean Development Mechanism. The ability of cocoa agro-forests to sequester carbon and to contribute to the slowing of climate change should be recognized by the Clean Development Mechanism of the Kyoto Protocol (CDM). Financing coming from the CDM should contribute to extending cocoa production in agro-forestry systems to promote the conservation of biodiversity.

Develop financial incentives for cocoa producers who respect the environment. Financial incentives could be provided to cocoa producers to help them develop their plantations in a way that conserves biodiversity. This could include incentives for producers to employ environmentally friendly technologies and practices. These incentives could be provided in direct proportion to the levels of biodiversity preserved. Among the financial incentives that might be considered are tax exemptions, exemption from duties and/or value added tax on the purchase of production inputs, and marketing assistance.

Other recommendations. Other recommendations include improving property rights, improving access to biodiversity, and strengthening institutions. Poor property rights in some areas are among the factors that constrain the expansion of cocoa production and lack of land limits the prospects for farmers to take advantage of the benefits that could be derived from liberalization in the cocoa sector. The Government of Cameroon should take appropriate measures to resettle producers to regions with low population levels where access to land is more readily available. Such efforts to relocate people to less populated areas have been undertaken in the past in Cameroon. Institutional strengthening at the professional level should include encouraging the development of producer associations for agriculture that respects the environment.

4.3 Implementing the policy recommendations

Implementing the policy recommendation in the IA will require cooperation among various stakeholders in the cocoa sector, the effective enforcement of relevant regulations, and practical measures to encourage initiatives that respect the environment and biodiversity.

The cooperation among the different institutions involved in the management of, and trade in, cocoa will help the industry regain its strategic place in the economy. Relevant institutions include government ministries responsible for agriculture, trade, forests and wildlife, and the

environment and protection of nature. The IA indicated that the laws related to liberalization in the cocoa sector did not take into account impacts on biodiversity. In the future, legislation developed by MINCOMMERCE should make reference to biodiversity and aim to create synergies among all the relevant ministries at the beginning of the process.

It is important to put in place regulatory measures that address the impacts identified in the IA, such as measures that could limit damage to forest resources, and to encourage practices that promote the conservation of biodiversity. This could be achieved by first, gaining a better understanding of cocoa-based agro-forestry systems and then promoting practices aimed at the conservation of biodiversity within cocoa plantations. This should include the development of cocoa varieties with improved performance in the cocoa agro-forests. Other measures worth promoting are: (i) research on, and development of, mechanisms to conserve biodiversity in cocoa production, (ii) improved education programmes for local populations to understand the environmental significance of cocoa agro-forests and diversity, as well as effect of ecosystem fragmentation, and (iii) improved methods for fighting pests and diseases associated with cocoa production.

The IA suggests that an action plan should be developed to implement the policy recommendations. The action plan should have two key components. The first should address issues related to institutions and regulations and address the lack of reference to biodiversity in regulations concerning the cocoa sector, along with the need for enhanced cooperation among relevant institutions. The second aspect of the plan should address strategic actions to: (i) promote cocoa production in the context of agro-forestry, (ii) oversee the intensification in the sector, (iii) sustainably use the ecosystems abutting the cocoa plantations and, (iv) implement practical innovations to promote biodiversity.