

ASSESSMENT OF COLOMBIA'S NATIONAL ENVIRONMENTAL SYSTEM (SINA)

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RESOURCES
FOR THE FUTURE

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Assessment of Colombia's National Environmental System (SINA)

Executive Summary

Allen Blackman, Sandra Hoffmann, Richard Morgenstern,
and Elizabeth Topping

A. Background

Contracted in December 2003, this Assessment of Colombia's National Environmental System (*Sistema Nacional Ambiental*, SINA) is an input into the World Bank's Colombia Country Environmental Assessment. As stated in the World Bank Terms of Reference, the goals of the study are to assess the effectiveness of the SINA organizations, namely the Ministry of Environment, the Autonomous Regional Corporations (*Corporación Autónoma Regional*, CAR), and municipal agencies and their institutional (human resource and technical) capacity to implement and enforce policies and regulations in priority areas. More specifically, the study's aim is to examine (i) the distribution of responsibilities among national, regional, and local environmental authorities, (ii) the existence of checks and balances within environmental agencies at various levels, (iii) the cross-sectoral and interinstitutional coordination mechanisms, (iv) monitoring capacity, and (v) the ways in which stakeholder interests are balanced in decisionmaking processes. The "effectiveness" of an institution is defined as the extent to which it performs the functions assigned to it by Colombia's 1991 Constitution, Law 99 of 1993, and related decrees, and thereby contributes to improved environmental quality.

Resources for the Future (RFF), a nonprofit research institute in Washington, D.C., carried out the study. The RFF team comprised Dr. Allen Blackman, Dr. Sandra Hoffmann, Dr. Richard Morgenstern, and Ms. Elizabeth Topping. This team worked closely with two Colombian consultants hired by the World Bank – Ing. Angel Esterling Lara and Lic. Juan Carlos García de Brigard.

B. Methods

To accomplish the goals of the Terms of Reference, the RFF team carried out four tasks, each involving the analysis of a different type or category of data:

TASK 1. ANALYSIS OF KEY LEGAL DOCUMENTS. To clarify the roles assigned to each of SINA's primary organizations, the RFF team analyzed Colombia's 1991 Constitution, Law 99 of 1993, and related decrees.

TASK 2. ANALYSIS OF DOCUMENTARY DATA. The RFF team reviewed and analyzed a variety of studies, reports, books, and articles on the performance of the primary SINA institutions and/or on the historical, legal, financial, informational and geophysical context in which they operate. These documents were collected by the World Bank and the RFF team from sources in Colombia and in the United States.

TASK 3. INTERVIEWS WITH SINA STAKEHOLDERS. The RFF team recognized from the outset that documentary evidence would not be sufficient to respond to the Terms of Reference for this study, for two reasons. First, by their nature, the questions addressed by this report are sensitive. For political reasons, frank evaluations of poorly performing government institutions are rarely written down. Second, as documented in our report, (and in many other reports), reliable, consistent, and up-to-date data – needed to evaluate the performance of government institutions and track changes in environmental quality – are exceptionally scarce in Colombia. This study therefore relies upon original interview data as well as documentary data.

In December 2003, three members of the RFF team – Dr. Blackman, Dr. Hoffmann, and Ms. Topping – traveled to Bogotá, where they interviewed 34 SINA stakeholders with a wide variety of positions, experiences, and perspectives. These stakeholders represent 18 different institutions. (Please see Appendix A for a complete list of interviews).

It is important to point out that given the time and resource constraints associated with this study, the RFF team was able to interview only a limited sample of stakeholders. In addition, interviewees were not randomly selected and not all interviewees were asked the same questions. As a result, their opinions are not necessarily representative.

That said, we believe these data are valuable for understanding the performance of SINA's major institutions, for at least three reasons. First, the interviewees were expressly selected to provide as much credible information as possible. More specifically, interviewees were selected to ensure adequate representation of all the major SINA institutions, the considerable diversity of opinions about SINA, and the views of stakeholders involved in the creation of SINA as well as those who participated in it at different points in time. Second, in directing the interviews, the RFF research team used its professional judgment developed through experience with similar research. Third, and perhaps most important, the RFF team used its professional judgment both in summarizing interviewee comments and in drawing conclusions from them. Our interviewees expressed a wide range of views about critical issues. In the interest of transparency, we have summarized most of these views in this report – we

have excluded only opinions that clearly contradict reliable documentary evidence or obviously reflect a strong personal bias. However, we recognize that some of the opinions our interviewees expressed reflect (more subtle) biases and politicking, a problem inherent in this type of interview research. Our strategy for dealing with this issue was to exclude some of the interview data in drawing conclusions. Specifically, we discounted all opinions except those that represented consensus among all the stakeholders interviewed and/or comported with credible documentary evidence.

TASK 4. REVIEW OF A SECOND COUNTRY'S EXPERIENCE WITH ENVIRONMENTAL DECENTRALIZATION. One of the overarching issues affecting SINA's performance is coordinating the activities of national and regional environmental regulatory authorities, given that the latter have a great deal of autonomy. All decentralized environmental management systems face this same challenge. To shed light on the challenges SINA faces, we have examined the United States' efforts to ensure coordination in a decentralized environmental management system. Unfortunately, given resource and time constraints, examining a third country, particularly a developing country, was not practical.

C. Findings: Challenges

We find that SINA faces 13 critical challenges, and we suggest 12 actions to help SINA overcome them.

1. Inadequate regulations

As discussed in Section 6.1.7, although Colombia has extensive environmental regulations, they are inadequate for a number of reasons. First, in many cases, urgently needed regulation simply does not exist. Second, some regulations are incomplete and lacking critical details. For example, the *Contraloría* notes that a lack of regulations regarding the scope and applicability of public hearings has made the use of such hearings virtually incoherent. Third, some regulations are overly prescriptive and potentially inappropriate to local economic and social circumstances. For example, command-and-control emissions standards have sometimes been adopted from more developed countries with little modification.

These inadequacies in Colombia's regulations lead to many problems. They contribute to poor coordination between the Ministry of Environment (since 2003, *Ministerio del Ambiente, Vivienda y Desarrollo Territorial*, Ministry of Environment, Housing and Territorial Development, MAVDT) and CARs by making it difficult for CARs to carry out one of their basic functions – implementing regulations established at the national level. They also make it difficult for other institutions in SINA to perform their assigned roles. For example, in 2003, the *Contraloría* noted that lack of regulation – from constitutional precepts to specific information standards – makes it difficult to advance

the Colombian System of Environmental Information. As discussed in Section 6.2.3, incomplete licensing and permitting regulations lead to inconsistent requirements and enforcement across CARs and therefore create opportunities for corruption. Lack of clarity of law and regulation also burdens Colombia's judicial system—a lack of clarity in Colombian environmental law (both statutes and regulations) may have contributed to the proliferation of *acciones de tutela* brought to protect the environment (see Section 6.8).

2. Limited environmental management capacity in some CARs and at MAVDT

As discussed in Section 6.2.2, environmental management capacity varies markedly across the CARs. For example, on average, only one-third of CAR staff is comprised of “professionals,” and 40% of CARs do not have functional environmental laboratories. Some of this heterogeneity is due to funding—almost three-quarters of the total revenue generated by all 33 of Colombia's CARs accrues to just 8 of the CARs (see Section 4.1.3). As illustrated in Section 8, numerous past evaluations of SINA have suggested correcting such imbalances (e.g., Galán 1998; Gómez Torres 2003; Wiesner 1997). Given the autonomy and importance of CARs within SINA, this marked variability in regulatory capacity is a significant problem that has far-reaching consequences. It implies, for example, that environmental regulations are stringently enforced in some CARs and virtually ignored in others. It also implies that locally generated funds are efficiently collected and invested in some CARs but are scarce and inefficiently invested in others.

Inadequate human and technical capacity is an issue at MAVDT as well as at CARs. Previous evaluations of SINA have concluded that the Ministry of Environment requires better-trained and more technically qualified civil servants (see Sections 8.3 and 8.6). As discussed in Section 6.1.2, several stakeholders interviewed for this report stated that human capacity at the Ministry of Environment are particularly low at the present time due to cuts in staffing and political appointments. Recent environmental ministers have also been criticized for lacking in expertise in the environmental sector.

3. Regulatory capture and corruption

As detailed in Section 6.1.6, numerous studies have documented high levels of regulatory capture and corruption in the Colombian government, and evidence also suggests that regulatory capture and corruption are significant problems within SINA, at both the national and the regional levels. (We use the terms to refer to situations where interest groups exert undue influence on the activities of environmental authorities, so that instead of acting to further social welfare, the authorities act to further the interests of select groups. Corruption involves violation of laws—for example, bribery and intimidation—but regulatory capture does not.) At the national level, private-sector interests have far more influence on environmental policymaking

than the organizations assigned responsibility for representing civil society – nongovernmental organizations (NGOs). As discussed in Section 6.9.1, national-level NGOs are relatively weak and have few meaningful avenues for participation, either formal or informal. The exact opposite is true of private-sector interest groups, however. For example, private-sector interests dominate the National Technical Advisory Council, a result of the composition of the council as laid out in Law 99 (see Section 3.2.5). In addition, since the mid-1990s, MAVDT has promulgated dozens of voluntary agreements with private industry. As discussed in Section 6.1.8, these agreements often serve to perpetuate and legitimize noncompliance by industry.

As discussed in Section 6.2.1, regulatory capture and corruption are also serious issues at the regional level. Private-sector interest groups have a strong influence on CAR decisionmaking. Members of boards of directors with strong ties to the private sector include not only two dedicated private-sector representatives, but often mayors and even NGO representatives, who sometimes represent spurious local organizations set up by, or closely tied to, industry. Private-sector influence aside, CAR decisionmaking is often unduly influenced by political considerations. For example, environmental investments such as reforestation are sometimes spatially targeted to maximize political payoffs instead of environmental benefits.

4. Inadequate enforcement

As discussed in Section 6.2.4, a wide variety of environmental regulations in Colombia are not consistently enforced. For example, of the effluent fees that CARs charge to polluters, only one-third are actually collected (Gómez Torres 2003, 40). Enforcement varies markedly across CARs, across sectors, and across sizes and types of firms. Contributing factors include a lack of political will and inadequate access to police assistance, as well as several of the problems discussed in Sections 6.1 and 6.2 – regulatory capture, low levels of human and technical capacity, poor information systems, reliance on voluntary regulation, and inadequate regulations.

5. Reliance on voluntary regulation

As discussed in Section 6.1.8, the Ministry of Environment's reliance upon voluntary clean-production agreements and voluntary environmental guides has raised serious concerns. Many voluntary clean-production agreements appear to have simply legitimized and perpetuated noncompliance with existing command-and-control regulations. The legal standing and purpose of environmental guides is not clear. In particular, confusion exists in the regulated community about whether compliance with voluntary environmental guides is a substitute for compliance with actual regulations. Also, the guides promote abatement strategies that are not always the most appropriate.

6. Lack of coordination between MAVDT and CARs

Law 99 assigned the Ministry of Environment the role of leading SINA and, in particular, of overseeing and coordinating the activities of CARs. A basic element of sound management, national-regional coordination is important for ensuring that CARs address environmental problems deemed of highest priority to Colombia, minimizing discrepancies in the enforcement and implementation, and taking advantage of economies of scale in policy and program implementation and in investment. As discussed in Section 6.1.3, unfortunately, considerable evidence—including major evaluations of SINA—suggests that the ministry's performance in this area has been inadequate (see Sections 8.1 and 8.3).

Poor coordination between MAVDT and CARs stems in part from contradictions in the design of SINA as established in Law 93. As discussed in Section 3.2, CARs have a great deal of autonomy. For example, the lion's share of their funding comes from internal sources—property taxes levied by municipalities, taxes on energy generation and petroleum extraction, and effluent fees—and they have a great deal of control over how these funds are spent. As discussed in Section 7 and Appendix B, other countries with decentralized environmental management systems face the same problem of coordinating national and regional authorities. Indeed, such tensions seem to be inherent in decentralized systems.

As discussed in Sections 3.2, 3.3, and 6.2, national authorities in Colombia have a variety of mechanisms at their disposal to ensure CARs act in accordance with national policies. First, CARs are required to submit 10-year, 3-year, and 1-year action plans that tie in with the national development plans drafted by the executive branch. Second, the National Department of Planning must approve CAR investment projects. Third, CARs boards of directors include a representative of the Ministry of Environment, as well as a representative of the president of Colombia. Fourth, Colombia's control organizations can discipline CARs for failure to implement plans or for abuse of office. Fifth, national authorities have some control over the salaries of CAR staff. Finally, in the past, the Ministry of Environment and other national institutions have contributed investment funds—or have allocated funds contributed by multilateral institutions—and this power of the purse has given them some sway over CAR investment projects. Similar mechanisms are used to coordinate EPA-state relationships in the United States (see Appendix B.4.)

Several factors limit the effectiveness of these mechanisms, however. As discussed in Section 5, the Ministry of Environment has very poor information about the investment, policy implementation, and regulatory enforcement activities of CARs. In addition, as discussed in Section 6.7, levels of staffing in the national office of the Delegate *Procuraduría* for Environmental Affairs are not adequate to monitor or evaluate the

performance of CARs, and the *Contaloría* is severely hampered by lack of data. As for regulations that mandate intensive planning at the regional level, as discussed in Section 3.3.3, previous evaluations have concluded that even when CARs do fulfill their planning requirements, they often follow only the letter of the law, rather than actually orient resource management. Finally, as discussed in Section 4, the current fiscal situation and a decline in multilateral funding severely constrains MAVDT's ability to co-finance investment.

7. Inadequate data on environmental quality and institutional performance

As discussed in Sections 5.2, 6.2.2, and 8, there is general recognition in Colombia that (i) a well-managed and well-functioning system for collecting and disseminating data on environmental quality and institutional performance is indispensable for environmental management, and (ii) Colombia's current system is inadequate. Many of our interviewees – from both inside and outside the government – cited lack of such a system as a critical contributor to SINA's failings.

Efforts to develop a consistent system of indicators and improve management of the Environmental Information System are underway at the national level and at the CAR level. However, similar past efforts have yielded little, and there little reason to be optimistic that present efforts will turn out differently. Moreover, even were there agreement on indicators, Colombia would need to make substantial progress to implement them, given SINA's limited capacity for data collection. As discussed in Section 5.2, Colombia's data collection infrastructure – including environmental laboratories, measuring stations, documentation centers, and basic cartography – is clearly inadequate. For example, 40% of the country's CARs either have no environmental laboratories or have laboratories that do not function at a minimal level.

8. Lack of priority setting across environmental subsectors and programs

As discussed in Section 6.4.4, SINA lacks a systematic mechanism for priority setting across environmental programs and subsectors, such as forestry, air pollution, water resources, and water sanitation. Planning is generally done sector by sector, and efforts to break out of "sectoral boxes" to consider prioritization across programs or sectors have not been successful. This problem, common to environmental regulatory systems around the world, arises in part because day-to-day work in most regulatory systems is organized by environmental media or problem areas, such as forestry, water, or air.

Lack of cross-sectoral planning contributes to imbalances in budgetary priorities: budgetary allocations are apparently driven more by institutional history than by environmental needs. For example, a recent audit of the Ministry of Environment found that rural environmental issues accounted for three-quarters of the ministry's investment budget, even though more than 70% of Colombia's population is urban.

Priority setting across subsectors and programs would, of course, be greatly enhanced by improvements in data collection and environmental indicators. Even given current information sources, however, greater attention to setting priorities across environmental subsectors would help improve the effectiveness of environmental management in Colombia.

9. Inadequate mechanisms for public participation

As discussed in Section 3, Colombia's 1991 Constitution and Law 99 create numerous mechanisms for public participation in both formulating and implementing and environmental policy. The primary mechanism for promoting participation in policy formulation is to ensure that NGO representatives serve on the boards and councils of advisory bodies, both at the national and the CAR level. As discussed in Section 6.9.1, this NGO-focused approach to ensuring public participation in policy formulation has yielded decidedly mixed results, in large part because Colombia's NGOs are still relatively weak and are provided few real opportunities for effective participation, at both the national and the regional level.

After the creation of ECOFONDO – now the main source of funding for environmental NGOs in Colombia – many important national-level NGOs withered and eventually disappeared. Many of the formal avenues for NGO participation, such as representation on the National Environmental Council, appear to be a mere formality. Historically, NGOs have depended largely on informal participation mechanisms, such as personal relationships with people inside MMA. But interview evidence suggests such informal information flows have diminished significantly in recent years.

NGO participation at the CAR level is widely considered particularly problematic. The representation of NGOs on CAR boards of directors is associated with cronyism – spurious NGOs are often created by local political and business interests to fill seats on CAR boards. NGOs working at the local level, particularly in rural areas, also confront problems both from lack of security and from a perception by the government that they are sympathetic to terrorists or are themselves subversive organizations. The continuing limitations of Colombia's NGO-focused approach to public participation in Colombia beg the question whether it is likely to be the most effective tactic.

Another important mechanism for ensuring participation is to make information about environmental issues more widely available. One means of doing this is to require early notification of the government's intention to make important policy changes. Colombia does not currently have a consistent system of prior notification of the government's intention to take many major actions, such as promulgation of major regulations. Nor is there systematic provision for public comment.

As discussed in Section 3, under Law 99, one mechanism for promoting public participation in the implementation of environmental policies is to allow interventions in licensing actions and public hearings over licenses. In this case, it is not the formal mechanism so much as its implementation that has failed. As discussed in Section 6.9.1, the use of hearings varies widely across CARs. Between 1998 and 2002, 40% of CARs did not hold any public hearings. Also, different CARs have a different notions of how the hearings are to be used, and this has contributed to corruption.

10. Poor coordination between the institutes of investigation and other SINA entities

As discussed in Section 6.5.1, coordination between the institutes of investigation and other SINA entities is poor. A particular problem is lack of coordination with MAVDT and especially the Institute of Hydrology, Meteorology and Environmental Studies (*Instituto de Hidrología, Meteorología y Estudios Ambientales, IDEAM*), which is responsible for managing environmental data in Colombia. Specifically, the institutes of investigation other than IDEAM tend to specialize in research that is academic and not especially relevant to policymaking. A number of factors contribute to this coordination problem. One is poor MAVDT leadership. Under Law 99, the Ministry of Environment is responsible for articulating SINA research priorities and, therefore, for informing agendas of the institutes of investigation. All available evidence suggests that SINA performs this function poorly, in part because no provision has been made in recent MAVDT budgets to provide staff time to consider research priorities, or to communicate those priorities to the institutes or other researchers. Second, MAVDT lacks capacity to make use of high-quality, policy-relevant research when it is produced. This is partly the fault of the research institutes, which could do a better job of making their research results “user-friendly.” Third, researchers at the institutes of investigation have different time lines than do policymakers. Scientific researchers inevitably tend to focus on long-term problems like biodiversity loss. Policymakers, by contrast, tend to focus on short-term issues, which change with each administration. Finally, national funding for the research institutes has declined, and as a result the institutes have had to rely on international funders whose priorities often are not aligned with those of SINA.

11. Potential adverse impacts from the merger of the Environment and Economic Development ministries

It is still much too early to gauge the impact of the merger of the Ministries of Environment and Economic Development. As discussed in Section 6.1.4, the merger may have both positive and negative impacts. On the positive side, it could help correct a longstanding bias in the Ministry of Environment in favor of “green” environmental issues (such as forestry and biodiversity) at the expense of urban environmental issues (such as air pollution and water pollution); facilitate better coordination of the siting,

licensing, and permitting of major water, sewage, and hazardous waste treatment facilities; mitigate the Ministry of Environment's tendency to ignore the costs of environmental regulation; and help mainstream environmental concerns.

On the negative side, however, as discussed in Section 6.1.4, the merger has the potential to seriously impair the Ministry of Environment's ability to play the role of SINA's "rector," as assigned to it by Law 99 (as well as subsequent legislation and practice). The merger could thus seriously weaken SINA by lowering the ministry's profile – and potentially its influence. In addition, the merger has the potential to impair the ministry's ability to carry out its permitting and licensing functions for national-scale investment projects, such as large-scale drinking water and sanitation projects (for a definition of such projects see Law 99 of 1993 Art. 52). It could have this effect by creating conflicts of interest between national authorities charged with promoting such investment projects and those charged with licensing and permitting them. Both sets of authorities are now housed within MAVDT. As noted in Section 6.1.4, several high-profile members of the environmental community have voiced extremely pessimistic views on the merger.

12. Potential conflicts of interest in the structure of Urban Environmental Authorities

Colombia's CARs are more or less financially self-sufficient, an arrangement intended to insulate them from regulatory capture by local interest groups. However, funding for Colombia's four Urban Environmental Authorities (*Autoridad Ambiental Urbana, AAU*) is now channeled principally through municipal governments.

As discussed in Section 4.2.3, prior to 1998, AAUs received financial resources from three main sources: self-generated revenue raised through the mechanisms established under Law 99 (principally property taxes); transfers from municipalities; and national contributions, including substantial credits from the World Bank for capacity building. Property tax revenues and the World Bank credits were the largest funding sources. After 1998, however, these two critical sources of funding were cut drastically. The Constitutional Court declared unconstitutional Article 9 of Decree 1339 of 1994, which had granted AAUs half of the property taxes raised by municipalities. Also, after 2000, the AAUs stopped receiving national funds.

Thus, AAUs now depend mainly on municipalities for financing. These same municipalities sponsor some of the important investment projects that AAUs must regulate. In addition, AAU directors general are appointed by the mayors of the cities that the AAU serves. These arrangements have the potential to create conflicts of interest.

13. Low public-sector spending on SINA

As discussed in Section 4.1.1, total public-sector spending on SINA is relatively low. The World Bank recommends that developing countries spend between 1.4% and 2.5% of gross domestic product (GDP) on the environment. In Colombia, total public-sector spending on the environment – including spending by CARs, the Ministry of Environment, and research institutes – averaged just 0.38% of GDP between 1995 and 2002, rising from 0.34% in 1995 to 0.37% in 2000.

The level of funding for the environment in Colombia may be less important than the efficiency with which funds are spent. For example, are funds being devoted to uses that have the greatest net benefits? Are funds being wasted because financial controls are lax? As discussed elsewhere in this report, considerable data suggest that the answer to these questions is frequently no.

D. Recommendations

This section describes 12 actions Colombia can take to meet the 13 challenges discussed above. Most of these actions address more than one of the challenges; after each recommended action, we list the challenges the action is meant to address.

1. Initiate a long-term program to review and rationalize regulations.

MAVDT should commission an independent study, or use existing studies, to identify and prioritize problems with regulations of environmental statutes, including gaps, inconsistencies, inappropriate levels of specificity, and technical requirements that are not appropriate to current local conditions in Colombia. The results of this analytical effort can be used to initiate a long-term program of rationalizing and reforming regulations.

Challenges addressed:

1. Inadequate regulations
3. Regulatory capture and corruption
4. Inadequate enforcement
5. Reliance on voluntary regulation
6. Lack of coordination between MAVDT and CARs

2. Evaluate and rationalize voluntary regulation.

There is little evidence to indicate that national-level voluntary clean-production agreements have promoted compliance with existing regulation or even that they have improved environmental performance. This conclusion comports with international experiences with voluntary regulatory compacts, in both industrialized and developing countries. Hence, further efforts to promote clean-production agreements in lieu of

mandatory regulation should be undertaken cautiously, if at all. At a minimum, any future voluntary agreements should shift the burden of proof to polluting firms by establishing clear periodic performance milestones (focusing on easily monitored activities) that would need to be met for the agreement to continue in force.

The argument for continued reliance on voluntary environmental guides is stronger. These guides appear to fill a need for user-friendly official guidance on how firms and farms can improve their environmental performance and how they can comply with regulations, which, as discussed above, are often incomplete and unclear. That said, the guides themselves have created considerable confusion. For this reason, efforts should be undertaken to modify them and to clarify the role they play within SINA. In general, the guides should be rewritten to ensure consistency with the existing command-and-control regulations. This effort should complement any effort undertaken to rationalize regulations. In addition, the legal status and implications of the guides should be clarified.

Challenges addressed:

1. Inadequate regulations
3. Regulatory capture and corruption
4. Inadequate enforcement
5. Reliance on voluntary regulation

3. Improve the collection, management, dissemination, and use of environmental data.

SINA's data management system can be enhanced in a number of ways. First, MAVDT can move quickly to develop clear, transparent, consistent indicators – of both environmental quality and institutional performance – that are feasible given the data collection and management capacity expected to prevail in Colombia in the medium term. Second, MAVDT should incorporate these indicators into the planning process that requires CARs to formulate and disseminate 1-year, 3-year, and 10-year environmental plans. Such indicators can be used to help CARs develop these plans and also help both CARs and national-level policymakers evaluate implementation efforts. Third, MAVDT should act to clarify the regulatory underpinnings of the Environmental Information System and improve its general management. Finally, MAVDT should work with CARs to improve data collection infrastructure and information management systems at the local level.

Challenges addressed:

1. Inadequate regulations
3. Regulatory capture and corruption
4. Inadequate enforcement
6. Lack of coordination between MAVDT and CARs

7. Inadequate data on environmental quality and institutional performance
8. Lack of priority setting across environmental subsectors and programs
9. Inadequate mechanisms for public participation
10. Poor coordination between research institutes and environmental regulators

4. Seek opportunities to strengthen the environmental NGO sector and build its political constituency.

The executive branch can help to strengthen the NGO sector in a number of ways. First, the Ministries of Environment and Education can promote environmental education by, for example, strengthening curricula that incorporate environmental subject matter and funding programs to train teachers in environmental sciences. Second, the Ministry of Environment, the research institutes, and the National Administrative Statistics Department (*Departamento Administrativo Nacional de Estadística, DANE*) can ensure the free availability of environmental data collected by SINA institutions, including facility-level and ambient monitoring data, and indicators of institutional performance. Third, the executive branch can ensure that NGOs are adequately represented both in formal deliberative bodies, such as the National Environmental Council, and in informal deliberations. Fourth, the executive branch can adopt reforms suggested below regarding enhancement of notice and comment mechanisms. Finally, the Ministry of Environment, the Colombian International Cooperation Agency (*Agencia Colombiana de Cooperación Internacional, ACCI*), and the Ministry of Foreign Affairs can encourage collaboration between Colombian and foreign NGOs with an eye toward improving domestic capacity. The goal is to help Colombian NGOs build strong, geographically and socially diverse constituencies and improve the ability of these constituencies to participate in the democratic process. Ultimately, it will likely be political strength that assures the public a strong voice in environmental policymaking.

Challenges addressed:

3. Regulatory capture and corruption
4. Inadequate enforcement
9. Inadequate mechanisms for public participation

5. Strengthen advance notice of significant environmental policy actions and provide opportunities for public input.

Public participation in policymaking requires that the public be informed when new policies are being considered, be provided with opportunities to comment on proposed new policies, and have their comments taken seriously. Public participation in environmental policymaking in Colombia could be strengthened by establishing formal procedures for facilitating such input at all levels of government. This would entail (i) establishing clear procedures and mandates for early notification of national and regional regulatory agencies' intent to draft new regulations or make major changes in

policy (for example, requiring that drafts of proposed regulations be published in the *Diario Legal* and/or on publicly accessible Web sites) and for public comment on these notices; (ii) building capacity for public comment in economic sectors with significant environmental impacts; and (iii) establishing requirements and developing the internal agency capacity to take comments into consideration in writing regulations and making policy, and to report back to the public on exactly how public comments were taken into consideration.

Challenges addressed:

3. Regulatory capture and corruption
4. Inadequate enforcement
9. Inadequate mechanisms for public participation

6. Establish a mechanism for setting priorities across environmental subsectors.

Although recent reforms may help address previously recognized problems in coordinating environmental planning between national and regional levels of government, there remains a need to coordinate planning across substantive areas of environmental policy, such as forestry and urban air pollution. Therefore, in its regular national planning, MAVDT should include a process of priority setting across environmental subsectors.

We recognize that Colombia's regional diversity implies that CARs may set very different goals and may use very different strategies to achieve them. Nevertheless, for the reasons discussed above, a regular priority-setting mechanism that accommodates this diversity – and the consequent need for policy flexibility – is likely to generate considerable benefits by helping to rationalize and coordinate environmental protection activities across subsectors, regions, administrative levels, and institutions. To promote legitimacy and “buy-in,” a participatory, transparent process should be used to set priorities.

One option is for MAVDT to require that each CAR periodically perform an assessment of the relative importance of various risks to human health and the environment in its jurisdiction. Furthermore, MAVDT can require that CARs use this comparative risk assessment to guide its allocation of financial, human, and technical resources. This recommendation is fleshed out in Blackman et al. (2004).

Challenges addressed:

6. Lack of coordination between MAVDT and CARs
8. Lack of priority setting across environmental subsectors and programs
10. Poor coordination between research institutes and environmental regulators

7. Explore strategies for improving coordination between MAVDT and CARs and building management capacity in CARs.

MAVDT should aggressively explore new strategies for improving coordination between itself and CARs and building management capacity in CARs. A necessary condition is a system for collecting credible data on the institutional performance of CARs (the topic of a separate recommendation). These data are needed for planning coordinated activities, monitoring compliance with such plans, and monitoring overall institutional performance. Actively disseminating such data – or even just publicly disclosing it – can create strong incentives for compliance with coordinated plans and for improved institutional performance.

Additional (potentially complementary) mechanisms are available. One is to strengthen the capacity and authority of SINA's control organizations, which in theory are responsible for ensuring that CAR activities comport with the law.

Another option is to hold an annual meeting of MAVDT and CAR representatives, which is fully open to the public. The meeting would have a number of aims: to improve CAR-MAVDT coordination; to disseminate best practices among CARs and raise average levels of regulatory capacity; and to increase transparency and information sharing. In addition, the meeting would enable CARs to publicly report on their activities and would thereby create incentives for improved institutional performance.

Still another option would be to enhance MAVDT's ability to co-finance investment projects at the regional level. As discussed in Section 7 and Appendix B, in countries with a decentralized environmental structure, co financing is often the most important tool national authorities have to ensure national-regional coordination. One disadvantage of this approach is that it would be less effective in CARs that have sufficient self-generated funds.

National environmental funds are likely the most efficient and transparent means of enhancing co financing. MAVDT could rely upon existing mechanisms – the National Royalty Fund, the Environmental Compensation Fund, the National Environmental Fund (*Fondo Nacional Ambiental*, FONAM), and the National Fund for Environmental Action. However, as discussed in Section 4.3.2, these funds have significant structural characteristics that render them less than ideal for the purpose at hand: each fund alone probably has resources that might not be sufficient to have the desired impact; several of the funds have goals other than coordinating national-regional environmental management and/or entail legal restrictions that would limit MAVDT's discretion in deciding how and where to disburse funds; some of the funds have been plagued by poor management; and some have limited resources outside national appropriations.

Given these constraints, MAVDT might consider consolidating and restructuring the existing funds, or creating a new fund.

Ideally, the fund – whether a modification of an existing mechanism or a new one – would have the following features: CARs would submit proposals for co financing to MAVDT, and MAVDT would evaluate and select proposals using clear and transparent criteria. In establishing these criteria, MAVDT's broad aim would be to maximize net benefits (benefits to human health and the environment net of total costs) but also to further national-regional coordination and reduce disparities across CARs in both regulatory capacity and access to environmental services. Thus, the proposal selection criteria would include such factors as the degree to which the project comports with national and regional environmental plans; the capacity of the particular CAR to implement the project; the level of environmental infrastructure in the particular CAR relative to other CARs; the need for capacity building in the particular CAR relative to other CARs; and the magnitude of the potential net benefits to human health and the environment from the proposed projects.

Conventional mechanisms would be used to ensure that project funds are well spent. First, to ensure that CARs are fully committed to the project, they would be required to supply a significant percentage of capital from their own coffers. Second, CARs would be required to collect clear, transparent baseline data, establish performance milestones based on specific monitorable criteria, and provide periodic progress reports on the extent to which these milestones have been met. Finally, clear failure to meet milestones would disqualify CARs from future co financing. Note that these mechanisms would help bolster MAVDT's ability to monitor CAR activities.

Challenges addressed:

2. Limited environmental management capacity in some CARs and at MAVDT
3. Regulatory capture and corruption
6. Lack of coordination between MAVDT and CARs
7. Inadequate data on environmental quality and institutional performance

8. *Establish national professional standards for key positions in CARs.*

MAVDT should establish national minimum professional standards for top positions in CARs. Individual CARs would be allowed to establish stricter standards, but not weaker ones. In the case of the director general, MAVDT could reassess existing national standards established under Decree 1768/1994 (Article 21). The principal aim of this effort would be to ensure that key CAR staff possess the technical qualifications needed to perform their jobs effectively, and to discourage hiring and promotion based on purely political criteria. The professional standards should allow for different qualifications in different CARs, given their regional diversity. Independent third

parties, such as universities and professional associations, should be responsible for assessing the extent to which candidates meet national standards. Even if the standards are not legally binding, a voluntary system of evaluation and public disclosure could have a positive impact and serve as a first step toward a more comprehensive system.

Challenges addressed:

2. Limited environmental management capacity in some CARs and at MAVDT
3. Regulatory capture and corruption

9. Recognize that attempting to improve the functioning of CARs through minor modifications in institutional design may have only minor impacts.

Leaving aside the question whether changes to Law 99 designed to improve the functioning CARs and coordination between the MAVDT and CARs are advisable, the Uribe administration's recent experience with reforms suggests that – barring any dramatic changes in the political landscape – only relatively minor changes will be politically possible for some time to come. In our view, such minor reforms are not likely to have significant impacts largely because the root causes of the problems such reforms seek to address are complex. Major factors contributing to the poor functioning of some CARs include social instability, poverty, systemic corruption, and weak institutions – in virtually every sector, not just the environmental sector.

Challenges addressed:

2. Limited environmental management capacity in some CARs and at MAVDT
6. Lack of coordination between MAVDT and CARs

10. Develop an agenda for Colombia's five research institutes and commission a study of their effectiveness.

MAVDT should periodically draft and disseminate an agenda for Colombia's research institutes to ensure that national policymakers assess, prioritize, and communicate their research needs. MAVDT should recognize that publication of this agenda alone will not solve problems of coordination between the institutes and policymakers, since the institutes will still require funding to pursue the agenda MAVDT drafts. This funding need not come from MAVDT exclusively. Indeed, the agenda by itself may help the research institutes raise outside funding for relevant research. However, outside funding is not likely to be sufficient. Therefore, MAVDT should investigate opportunities for funding research relevant to its agenda. One option would be to establish a competitive research grants process focused on national research priority areas, the funding for which could come partly from foreign sources.

MAVDT should also commission a study of the effectiveness of the current configuration of four independent research-oriented institutes of investigation (not

including IDEAM). The study should consider the advisability of reducing the number of research institutes by consolidation or elimination.

Challenge addressed:

10. Poor coordination between research institutes and environmental regulators

11. Investigate opportunities for enhancing the Urban Environmental Authorities' political and financial autonomy.

To avoid conflicts of interest, options should be investigated to limit municipalities' control over AAU funding and over the appointment of AAU top management. Such options include allocating to AAUs a dedicated percentage of certain municipal tax revenues.

Challenges addressed:

3. Regulatory capture and corruption

12. Potential conflicts of interest in the structure of AAUs.

12. Appoint an independent commission to evaluate the effects of the merger of Environment and Economic Development Ministries.

Appoint an independent, nonpartisan commission to evaluate the impacts of the merger on MAVDT's ability to play its role as SINA's "rector" and to regulate the provision of national-scale infrastructure (for a definition of such projects, see Law 99 of 1993 Art. 52). We recommend that the commission be appointed promptly and issue an interim report within 12 months of being appointed, and a final report within 24 months. The naming of the commission, its methodology, and its reporting should be transparent, and the commission's report should be made fully available to the public.

Ideally, the commission would serve a dual function. First, it would provide the data policymakers need to assess the impacts of the merger of the ministries and to take any remedial action needed. Second, it would create incentives for national policymakers to be proactive in minimizing potential damages from the merger. For example, some of our interviewees argued that the degree to which the merger damages SINA will depend largely on the selection of MAVDT ministers and their performance, particularly the extent to which they focus on environmental issues as opposed to housing and economic development. The existence of the commission, and the knowledge that it will issue a public report, may create incentives for the president to appoint MAVDT ministers with strong environmental credentials, and for those ministers to focus on environmental issues.

We would note that an argument exists for appointing a commission to investigate the impact of national restructuring of the environmental sector, even if no commissions are

created to investigate the impacts on other sectors. Unlike the constituencies of other ministries, the constituency of the Ministry of Environment – the public at large – is diffuse, disorganized, and underrepresented by lobbying organizations.

Challenges addressed:

2. Limited environmental management capacity in some CARs and at MAVDT
3. Regulatory capture and corruption
7. Inadequate data on environmental quality and institutional performance
11. Potential adverse impacts from the merger of the Environment and Economic Development ministries

1. Introduction

1.1. Background

Contracted in December 2003, this Assessment of Colombia's National Environmental System (*Sistema Nacional Ambiental*, SINA) is an input into the World Bank's Colombia Country Environmental Assessment. As stated in the World Bank Terms of Reference, the goals of the study are to assess the effectiveness of the SINA organizations, namely the Ministry of Environment, the Autonomous Regional Corporations (*Corporación Autónoma Regional*, CAR), and municipal agencies and their institutional (human resource and technical) capacity to implement and enforce policies and regulations in priority areas. More specifically, the study's aim is to examine (i) the distribution of responsibilities among national, regional, and local environmental authorities, (ii) the existence of checks and balances within environmental agencies at various levels, (iii) the cross-sectoral and interinstitutional coordination mechanisms, (iv) monitoring capacity, and (v) the ways in which stakeholder interests are balanced in decisionmaking processes. The "effectiveness" of an institution is defined as the extent to which it performs the functions assigned to it by Colombia's 1991 Constitution, Law 99 of 1993, and related decrees, and thereby contributes to improved environmental quality.

Resources for the Future (RFF), a nonprofit research institute in Washington, D.C., carried out the study. The RFF team comprised Dr. Allen Blackman, Dr. Sandra Hoffmann, Dr. Richard Morgenstern, and Ms. Elizabeth Topping. This team worked closely with two Colombian consultants hired by the World Bank – Ing. Angel Esterling Lara and Lic. Juan Carlos García de Brigard.

1.2. Methods

To accomplish the goals of the Terms of Reference, the RFF team carried out four tasks, each involving the analysis of a different type or category of data:

TASK 1. ANALYSIS OF KEY LEGAL DOCUMENTS. To clarify the roles assigned to each of SINA's primary organizations, the RFF team analyzed Colombia's 1991 Constitution, Law 99 of 1993, and related decrees.

TASK 2. ANALYSIS OF DOCUMENTARY DATA. The RFF team reviewed and analyzed a variety of studies, reports, books, and articles on the performance of the primary SINA institutions and/or on the historical, legal, financial, informational and geophysical context in which they operate. These documents were collected by the World Bank and the RFF team from sources in Colombia and in the United States.

TASK 3. INTERVIEWS WITH SINA STAKEHOLDERS. The RFF team recognized from the outset that documentary evidence would not be sufficient to respond to the Terms of Reference for this study, for two reasons. First, by their nature, the questions addressed by this report are sensitive. For political reasons, frank evaluations of poorly performing government institutions are rarely written down. Second, as documented in our report, (and in many other reports), reliable, consistent, and up-to-date data – needed to evaluate the performance of government institutions and track changes in environmental quality – are exceptionally scarce in Colombia. This study therefore relies upon original interview data as well as documentary data.

In December 2003, three members of the RFF team – Dr. Blackman, Dr. Hoffmann, and Ms. Topping – traveled to Bogotá, where they interviewed 34 SINA stakeholders with a wide variety of positions, experiences, and perspectives. These stakeholders represent 18 different institutions. (Please see Appendix A for a complete list of interviews).

It is important to point out that given the time and resource constraints associated with this study, the RFF team was able to interview only a limited sample of stakeholders. In addition, interviewees were not randomly selected and not all interviewees were asked the same questions. As a result, their opinions are not necessarily representative.

That said, we believe these data are valuable for understanding the performance of SINA's major institutions, for at least three reasons. First, the interviewees were expressly selected to provide as much credible information as possible. More specifically, interviewees were selected to ensure adequate representation of all the major SINA institutions, the considerable diversity of opinions about SINA, and the views of stakeholders involved in the creation of SINA as well as those who participated in it at different points in time. Second, in directing the interviews, the RFF research team used its professional judgment developed through experience with similar research. Third, and perhaps most important, the RFF team used its professional judgment both in summarizing interviewee comments and in drawing conclusions from them. Our interviewees expressed a wide range of views about critical issues. In the interest of transparency, we have summarized most of these views in this report – we have excluded only opinions that clearly contradict reliable documentary evidence or obviously reflect a strong personal bias. However, we recognize that some of the opinions our interviewees expressed reflect (more subtle) biases and politicking, a problem inherent in this type of interview research. Our strategy for dealing with this issue was to exclude some of the interview data in drawing conclusions. Specifically, we discounted all opinions except those that represented consensus among all the stakeholders interviewed and/or comported with credible documentary evidence.

TASK 4. REVIEW OF A SECOND COUNTRY'S EXPERIENCE WITH ENVIRONMENTAL DECENTRALIZATION. One of the overarching issues affecting SINA's performance is

coordinating the activities of national and regional environmental regulatory authorities, given that the latter have a great deal of autonomy. All decentralized environmental management systems face this same challenge. To shed light on the challenges SINA faces, we have examined the United States' efforts to ensure coordination in a decentralized environmental management system. Unfortunately, given resource and time constraints, examining a third country, particularly a developing country, was not practical.

1.3. Organization of the report

1.3.1. Rationale

Institutions do not operate in a vacuum. To understand and assess their performance, it is critically important to first understand their historical, legal, financial, informational, and geophysical context, and to consider how this context affects institutional performance. This rationale informs the organization of our report. We first review background material on SINA – its history, legal underpinnings, finances, information systems, and geophysical environment – and then we present direct evidence on the performance of the major SINA institutions.

Two sections follow the evidence on SINA's performance and complete the body of the report: a section reviewing another countries' experiences with some of the same structural problems that confront SINA, and a section briefly summarizing findings and recommendations of other major institutional analyses of SINA. The purpose of these two sections is to provide readers who are somewhat knowledgeable about the performance of SINA institutions (having read Section 6) with additional information on various policy options for improving this performance. The last section of the report presents our findings and recommendations.

Our organizing structure has the disadvantage of delaying until the middle of the report material directly related to its broad objective – assessing the performance of SINA. In addition, some readers will already be familiar with the background material presented in the beginning of the report. Nevertheless, we feel that this organization is the most logical and coherent alternative. We would advise readers who don't need the background material presented in the first half of the report to proceed directly to evidence on performance, in Section 6.

1.3.2. Types of evidence

As Section 1.2 indicates, our report relies on evidence from primary and secondary documents, as well as from interviews. We used primary documents to describe and assess SINA's legal underpinnings and the environmental challenges it faces. We relied upon secondary documents to analyze SINA's history, finances, environmental

challenges, and performance. Finally, we used interview data help assess SINA's performance and develop conclusions and recommendations.

1.3.3. Overview

The remainder of this report is organized as follows. The next four sections provide background information. **Section 2** presents a brief overview of the history of environmental and natural resource management in Colombia leading up to the 1991 Constitution. **Section 3** briefly describes the environmental provisions of the 1991 Constitution and discusses Law 99 of 1993, which created SINA; it then summarizes major environmental legislation and regulation since the passage of Law 99 and offers a brief analysis of some of the legal underpinnings of SINA (apart from the performance of the system). **Section 4** discusses findings from a recent study of financial resource allocation within SINA. **Section 5** summarizes data on the current state of Colombia's environment and its environmental data systems. **Section 6** summarizes documentary and interview evidence on the performance of major SINA institutions since 1993 and also considers (in the last subsection) the performance of various mechanisms for institutional learning. To shed light on the challenges Colombia faces in coordinating a decentralized system of environmental management, **Section 7** examines the U.S. experience. **Section 8** briefly reviews the principal findings and recommendations of several previous evaluations of SINA. **Section 9** ties together the evidence presented in the previous 8 sections. It is split into two parts. The first part describes 13 key challenges that SINA faces, and the second part discusses 12 recommended actions that can help Colombia meet these challenges. The report has four appendixes. **Appendix A** lists the SINA stakeholders interviewed for this report. **Appendix B** examines (in more detail than Section 7) the United States' experience with decentralized environmental management. **Appendix C** presents four organizational diagrams of the Ministry of Environment and the Ministry of Environment, Housing and Territorial Development. **Appendix D** provides a glossary of Spanish acronyms used in the report.

1.4. Preview of findings and recommendations

This subsection previews the findings and recommendations presented in detail in Section 9. We find that SINA faces 13 critical challenges and we suggest 12 actions to help it overcome them.

1.4.1. Challenges

1. Environmental regulations are often incomplete and/or potentially inappropriate to local circumstances.
2. Human and technical environmental management capacity in some CARs and in MAVDT is inadequate.

3. Certain interest groups appear to exert undue influence on the activities of environmental authorities, so that instead of acting to further social welfare, the authorities act to further the interests of select groups.
4. A wide variety of environmental regulations in Colombia are not consistently enforced.
5. MAVDT and CARs rely upon voluntary regulation that in many cases perpetuates noncompliance with existing command-and-control regulations.
6. Coordination between MAVDT and CARs is inadequate.
7. Data on environmental quality and institutional performance are inadequate.
8. SINA lacks a systematic mechanism for priority setting across environmental programs and subsectors such as forestry, air pollution, water resources, and water sanitation.
9. The mechanisms that Colombian law has established to promote public participation in SINA are relatively weak.
10. Coordination between the institutes of investigation and other SINA entities – particularly MAVDT and CARs – is poor.
11. The merger of the Ministries of Environment and Economic Development has the potential to impair the new agency's ability to play the role of SINA's "rector," as assigned to it by Law 99.
12. AAUs now depend financially and politically on the municipalities they are charged with regulating, an arrangement that has the potential to create conflicts of interest.
13. Total public-sector spending on the environment – including spending by the CARs, MAVDT, and research institutes – falls well below the World Bank's recommended levels.

1.4.2. Recommendations

1. Initiate a long-term program to review and rationalize regulations.
2. Evaluate and rationalize voluntary regulation.
3. Improve the collection, management, dissemination, and use of environmental data.
4. Seek opportunities to strengthen the environmental NGO sector and build its political constituency.
5. Strengthen advance notice of significant environmental policy actions and provide opportunities for public input.
6. Establish a mechanism for setting priorities across environmental subsectors.
7. Explore strategies for improving coordination between MAVDT and CARs and building management capacity in CARs.
8. Establish national professional standards for key positions in CARs.
9. Recognize that attempting to improve the functioning of CARs through minor modifications in institutional design may have only minor impacts.

10. Develop an agenda for Colombia's five research institutes and commission a study of their effectiveness.
11. Investigate opportunities for enhancing AAUs' political and financial autonomy.
12. Appoint an independent commission to evaluate the effects of the merger of the Environment and Economic Development ministries.

2. Institutional History, 1952–1993

In many Latin American countries, environmental management institutions and capacity developed at the national level first, and much later at the regional level. This has not been the case in Colombia, however. Since the early 1950s, Colombian environmental management capacity has been split between the national and regional levels. This section provides a brief overview of the development of Colombian environmental institutions and capacity through 1993, when Law 99 created the National Environmental System (*Sistema Nacional Ambiental*, SINA). The first subsection focuses on the regional level and the second on national level.

2.1. Regional environmental management

Colombia's regional environmental management institutions are known as Autonomous Regional Corporations (*Corporaciones Autónomas Regionales*, CARs). Colombia's first CAR, the Autonomous Regional Corporation of the Valle del Cauca (*Corporación del Valle del Cauca*, CVC), was created in 1954 to promote integrated regional economic development (Ministry of Environment et al. 2002). CVC's geographic boundaries were defined by the Valle del Cauca watershed. The design of CVC was strongly influenced by contemporaneous thinking about development planning in North America and Latin America. CVC was modeled after the Tennessee Valley Authority in the United States but also reflected the growing popularity of integrated regional planning in Latin America – a trend encouraged by the influential Economic Commission for Latin America (Gómez Torres 2003).

Between 1960 and 1988, a total of 18 CARs were created. Watersheds eventually ceased to define the geographic boundaries of these institutions, in large part because each of Colombia's departments (*departamentos*) lobbied for its own CAR (Rodríguez Becerra 1994). During this period, national funding accounted for approximately half of CAR budgets. The other half was generated internally by, among other things, fees for the provision of sanitation and other services, environmental fees, and municipal property taxes.

Although the majority of the CARs focused their resources on infrastructure, land development, and ranching, their functions were, on the whole, quite varied and included electricity generation and transmission, telecommunications, transportation, flood control, sanitation, potable water, and cattle ranching (Sánchez Triana 1999). This diversity of functions may explain CARs' somewhat confused relationship to the national bureaucracy prior to 1993. They were first attached to the Ministry of Economic Development (1960–1968), then to the Ministry of Agriculture (1968–1977), and finally to the National Department of Planning (*Departamento Nacional de Planeación*, DNP,

1977–1993). In 1987 President Virgilio Barco issued a decree that clarified the functions of CARs and transferred functions such as road infrastructure and telecommunications to other specialized entities. Nevertheless, CARs retained responsibility for both management of natural resources and economic development (Ministry of Environment et al. 2002).

As discussed in detail in Section 3, Law 99 of 1993 redefined the roles, functions, and jurisdictions of the CARs. Although CARs retained some of their economic development functions, they were essentially recast as environmental management authorities. Law 99 also established additional CARs, along with Autonomous Sustainable Development Corporations (*Corporaciones de Desarrollo Sostenible*, CDSs), a similar regional authority in territories reserved for indigenous peoples, and Urban Environment Authorities (*Autoridades Ambientales Urbanas*, AAUs) in the cities with more than 1 million inhabitants.¹ This proliferation of regional environmental authorities ensured that the entire national territory was under the jurisdiction of a regional environmental authority.

2.2. National environmental management

2.2.1. Division of Natural Resources, Ministry of Agriculture, 1952–1968

Modern national environmental management in Colombia began in 1952 with the creation of the Division of Natural Resources within the Ministry of Agriculture. The division's mission was to ensure the rational development of natural resources, such as forests and fisheries. Administration was centralized and funding was derived exclusively from the national budget, an institutional structure that was virtually universal in Colombia at the time (Gómez Torres 2003). Widely considered the first triumph of the country's "greens," the division managed to further conservation even as the Ministry of Agriculture promoted development of natural resources. Under the division's leadership, Colombia's first forest conservation regulations were issued, and seven sizable protected areas were created.

2.2.2. National Institute of Natural Renewable Resources, 1968–1993

In 1968, the government of President Carlos Lleras Restrepo created a new national environmental management institution called the National Institute of Natural Renewable Resources and Environment (*Instituto Nacional de los Recursos Naturales*

¹ Today, Colombia has 33 CARs. One CAR was absorbed into another in the late 1990s. Colombia's four AAUs are the *Departamento Administrativo de Medio Ambiente de Bogotá* (DAMA) in Bogotá, the *Departamento Administrativo de Medio Ambiente de Cali* (DAGMA) in Cali, the *Departamento Administrativo de Medio Ambiente de la Oficina Area Metropolitana de Medellín* (AREA) in Medellín, and the *Departamento Administrativo de Medio Ambiente de Barranquilla* (DADIMA) in Barranquilla.

Renovables, INDERENA) by fusing the Division of Natural Renewable Resources in the Ministry of Agriculture with a CAR, the *Corporación Autónoma Regional del Magdalena*. INDERENA, like the Division of Natural Resources that preceded it, retained an affiliation with the Ministry of Agriculture. Under INDERENA's leadership, Colombia made important advances in environmental management.

2.2.3. Environmental legislation and regulation

Significant new environmental regulations under INDERENA included the 1969 Forestry Law, a 1973 statute covering flora, and a 1977 statute creating the National Parks System. By far the most important new legislation, however, was the 1974 National Natural Renewable Resources and Environmental Protection Code, a comprehensive statute that remains one of the pillars of Colombian natural resource and environmental law. The code's 340 articles cover water, air, solid and hazardous waste, soil, flora, and fauna. It was one of the first environmental protection laws in the world to incorporate pollution fees and environmental impact assessments. The code's first regulatory decrees, issued between 1974 and 1978, dealt with a variety of topics, including the management of forestry reserve areas, the provision of environmental education, and the protection of wild fauna and hydrobiological resources (Ministry of Environment et al. 2002).

2.2.4. Pressures for institutional reform

INDERENA faced two important challenges. First, it had a small budget relative to its responsibilities. By end of the 1980s, Colombia's 18 CARs covered only a quarter of the national territory; INDERENA was completely responsible for environmental management in the remaining territory. Dr. Julio Carrizosa, an ex-INDERENA director, once pointed out that his organization had less than 5 pesos to protect each hectare of national territory, whereas CVC had more than 17,000 pesos per hectare (Ministry of Environment et al. 2002).

Second, like the Division of Natural Resources, INDERENA was constrained by its affiliation with the Ministry of Agriculture. INDERENA worked to protect the same natural resources that ministry offices sought to develop. Manuel Rodríguez Becerra, the first minister of Environment, points out that INDERENA was greatly weakened by "the secondary place that [it] occupied in the Ministry of Agriculture and the conflict inherent in the fact that [the Ministry] was one of the principal users of natural renewable resources (1994, 16)."

Third, INDERENA – and environmental management generally – was weakened by the continued dispersion of environmental functions across many different national and regional organizations, including the Ministry of Health, the Ministry of Mining and Energy, the Maritime and Port Directorate, DNP, and the Institute of Hydrology,

Meteorology and Land Suitability. The creation of INDERENA seems to have done little to rectify this situation. For instance, environmental licensing was transferred from INDERENA to the Ministry of Mining, while fishery management was transferred to a new National Institute of Fishing. Simultaneously, INDERENA gradually lost jurisdiction in the areas where 16 new CARs were created. According to Rodríguez Becerra, this dispersion amounted to a “slow death through dismemberment,” a “process that was never planned” (Rodríguez Becerra 1994, 14–16).

In the mid-1980s, Colombian environmentalists and concerned stakeholders both within the fledgling environmental management bureaucracy and outside it formed an alliance, encouraged by the unprecedented international attention then being devoted to environmental issues in developing countries. In addition, it was spurred by increasing evidence of a rapid deterioration of environmental quality in Colombia (Rodríguez Becerra 1994). This new alliance lobbied for a major restructuring of environmental management in Colombia. INDERENA itself encouraged and participated in this effort. An important theme of the debate was whether and how to decentralize environmental authority, at the time a trend throughout Latin America (Dillinger and Web 1999). A 1985 consulting study of environmental management in Colombia concluded that such decentralization was in order (Ministry of Environment et al. 2002). The study, which had been contracted by INDERENA, found that administration and management of natural renewable resources could be performed better at a regional level and proposed the creation of an administrative department to which CARs would be attached (Rodríguez Becerra 1994).

These currents culminated in INDERENA's proposal to create an independent Administrative Department of Natural Renewable Resources and the Environment (*Departamento Administrativo de Recursos Naturales*) that would raise the status of environmental management. The proposal was controversial, however, and failed because it threatened the autonomy of the CARs (Ministry of Environment et al. 2002). Yet the alliance of environmentalists continued to call for the creation of a national entity charged with coordinating environmental management.

In November 1990, the César Gaviria Trujillo administration presented Congress with a bill to create a new national environmental system, including a national ministry that would coordinate the decentralized management. Discussions of the proposal coincided with the 1991 constitutional reform, which significantly changed the structure of governance in all sectors (see Section 3). The design of the proposed environmental system was adjusted in response to the passage of the new Constitution. The first important government documents on environmental policy reform – issued by the National Council on Economic and Social Policy (*Consejo Nacional de Política Económica y Social*, CONPES) – were approved in 1991 and paved the way for the creation of SINA in 1993.

3. Sina's Legal Foundation

For the most part, Colombia's current environmental management system, SINA, was created by two major pieces of legislation: the Constitution of 1991 and Law 99 of 1993. Both bear the stamp of concerns about democratization, decentralization, and sustainable development that dominated the Rio Conference and policy discussions on political development in Latin America in the 1980s. The first part of this section discusses the elements of the 1991 Constitution relevant to SINA, and the second part discusses Law 99. The third part surveys key legal developments since Law 99. The section ends with a discussion of inconsistencies and gaps in SINA's legal underpinnings.

3.1. The 1991 Constitution

3.1.1. Basic structure of governance

A major motive of the 1991 constitutional reform was to establish a more decentralized and participatory government (Art. 1). The Constitution reflects movement away from a highly centralized, unitary government but does not abolish it. For example, the Constitution gives departments, municipalities, and CARs autonomy to plan and administer local policy (in coordination with national planning), pass local decrees and ordinances (Arts. 300 and 313), and impose taxes that are not transferable to the national level (Art. 362). However, all three entities are part of the executive branch of the national government (Art. 115). Furthermore, governors and mayors are elected by the public but are agents of the president and can be removed from office by the president (Arts. 260, 303, 314, and 315).

The CARs are created to serve an explicitly environmental management function, but their governance structure and relationship to the national government are similar to those of departments and municipalities. The 1991 Constitution gives Congress the power to create and regulate the functioning of CARs and specifically requires that CARs be autonomous (Art. 150). The 1991 Constitution created one CAR, the CAR del Río Grande de la Magdalena, with the specific purpose of water resource development.

3.1.2. Environment

The 1991 Constitution gives environmental concerns extraordinary emphasis. It defines protection of Colombia's natural resources as a basic purpose of the state, on a par with national defense (Art. 8), and it creates a collective right to a healthy environment (Art. 79). The preservation of the environment is one of only three cases in which the government can limit "economic liberty," an important right in the Colombian Constitution (Arts. 333 and 334). The Constitution requires the state to protect the

diversity and integrity of the environment, conserve areas of particular ecological importance, and promote environmental education as a means of achieving these goals (Art. 79). The state must also plan the management and exploitation of natural resources with the goal of guaranteeing “their sustainable development, conservation, restoration or substitution” (Art. 80). Finally, the Constitution specifically requires the promulgation of laws governing exploitation of nonrenewable resources (Art. 360).

3.1.3. National planning

The 1991 Constitution envisions a government with extensive planning responsibilities, including those related to environmental protection. It creates a national system of planning and requires the president to draft a National Development Plan (*Plan Nacional de Desarrollo*) and to present it to Congress within six months of taking office (Arts. 339–344). This plan, which typically includes environmental provisions, must include long-term goals, medium-term priorities for action, and short-term strategies for implementation.

The Constitution also creates a National Planning Council (*Consejo Nacional de Planeación*) to serve as a forum for discussion of the National Development Plan (Art. 340). The council is intended to be both a means of coordination across government agencies and a mechanism for public participation. Members of the council are appointed by the president from a list of nominees assembled by other government ministries as well as private-sector organizations, including those working on environmental protection (Art. 340). The national government is required to take into account the opinion of the council in developing its National Development Plan, although the Constitution creates no specific mechanisms for ensuring that this is done (Art. 341).

The territorial governments are also required to develop plans in consultation with the national government under the advice of Territorial Planning Councils (Art. 339). The same basic consultative structure for planning was later adopted in Law 99 for the CARs.

3.1.4. Government oversight

The Constitution establishes a system of government oversight and auditing that plays a central role in SINA. It creates two independent offices, the *Contraloría General de la República* and the *Procuraduría General de la República* (Tit. 10, Chaps. 1 and 2). Directors of both organizations are elected by Congress, and both report directly to Congress (Arts. 267 and 276). The *Contraloría* is responsible for fiscal oversight, including financial auditing, and broader evaluation of the cost-effectiveness of government programs (Art. 119). Each year the *Contraloría* must present Congress with a report on the state of the environment and natural resources in Colombia (Art. 268).

The *Procuraduría* has responsibility for ensuring that the Constitution and laws of Colombia are upheld (Art. 277). In particular, it is responsible for ensuring that public officials act within the scope of their authority, carry out their public charges, and do not abuse their offices (Art. 278). The *Procuraduría* is also responsible for assessing whether the regional plans are actually implemented. Finally, it has the responsibility to defend collective interests, defined in the Constitution to include protection of the environment (Art. 277).

3.1.5. Revenue

The Constitution creates a revenue base dedicated specifically to the environmental protection activities of the government. Municipalities must transfer a percentage of municipal property taxes to the CARs for environmental management (Art. 317). The Constitution also creates the National Royalty Fund from the proceeds of a severance tax on the exploitation of nonrenewable resources. The tax is targeted at ecological preservation in the departments and municipalities where the extractive activities occur (Art. 360-361). The Constitution assigns to the state ownership of all unclaimed subsurface rights and unclaimed rights to nonrenewable resources (Art. 332).

3.1.6. Public participation

The 1991 Constitution envisions a central role for individual citizens and nongovernmental organizations in formulating and implementing environmental policy. In addition to having a right to a healthy environment (Art. 79), citizens have an express duty to protect natural resources and the environment (Art. 95.8).

The Constitution creates three causes of action through which citizens can intervene in the Colombian courts to protect the environment. First, any citizen or group of citizens may bring a popular action (*acción popular*) to protect the collective right to a clean environment, even if they cannot demonstrate direct, personal damage (Art. 88). Second, any person may bring a compliance action (*acción de cumplimiento*) to ensure that laws—including environmental laws—are upheld (Art. 77). Finally, the Constitution allows the law to establish cases in which an action requesting injunctive relief (*acción de tutela*) can be brought to prevent violation of fundamental rights (Art. 86). The Constitution also requires that the law establish those cases in which an *acción de tutela* can be brought to protect “the collective interest” (Art. 86). The Constitutional Court of Colombia has interpreted the Constitution to allow an *acción de tutela* to protect the right to a clean environment where environmental deterioration threatens human health (Iguarán 2001). This has proven to be an important tool in environmental protection, since it provides virtually immediate injunctive relief—courts must issue a decision within 10 days.

Aside from those mechanisms of participation, which depend on access to courts, the 1991 Constitution guarantees participation of the community in decisions that may affect them (Art. 2). It specifically requires adoption of statutes that guarantee community participation in decisions that affect the environment (Art. 79).

Furthermore, the Constitution stipulates that an essential purpose of government is to facilitate such participation (Art. 2). As a result, the state has a duty to provide citizens with sufficient understanding about environmental protection to enable them to fulfill their duty to protect the environment (Art. 67). The Constitution creates several specific mechanisms for public participation, including the right to petition public authorities (Art. 23), public hearings, open meetings, referendums, and standard participation in elections (Art. 103). For the most part, the Constitution does not specify precisely how these mechanisms will be implemented. In the case of the *Contraloría*, however, the Constitution does require adoption of laws that create systems to allow citizens to monitor public fiscal management at all levels of government.

3.2. Law 99

Law 99 created Colombia's environmental management system, SINA. The Law's drafters intended SINA to provide all stakeholders in the environmental sector with a coordinated mechanism for protecting the environment. Consistent with the Constitution of 1991, this management system was to be decentralized, democratic and participatory. Law 99 defines SINA as a "set of orientations, norms, activities, resources, programs and institutions that allow the implementation of general environmental principles" oriented around a model of sustainable development (Law 99 Art. 4). SINA may be thought of as a management system made up of actors, coordination and planning mechanisms, mechanisms for public participation, legal norms, mechanisms for implementing and enforcing policy, and financial resources (Box 1).

Box 1. Elements of Colombia's National Environmental Management System (SINA)

SINA entities

Key government environmental authorities

- Ministry of the Environment
- CARs, AAUs, and CADSs
- National Park System

Territorial authorities

- Departments
- Municipalities
- Territories of Indigenous Peoples

Other govt. institutions with environmental responsibilities

- National Planning Department
- Government oversight institutions
- Ministries other than MAVTD
- Research Institutes
- National Environmental Council
- Technical Advisory Council

Private research institutions

Civil society

- Environmental nongovernmental organizations
- Private firms and farms

SINA instruments of governance and management

Legal norms

- 1991 Constitution
- Environmental laws
- Implementing decrees
- Enforcement actions

Other instruments of governance

- Licensing
- Planning
- Funding
- Economic instruments
- Public participation

3.2.1. Goals

Law 99 organized SINA around 14 guiding principles (Law 99 Art. 1):

1. Economic and social development in Colombia will be guided by the goal of sustainable development laid out in the Rio Conference.
2. Biodiversity must be protected and should only be used sustainably.
3. Population policy will take into account the right to a healthy environment.
4. Headwaters and estuaries will be given special protection.
5. Human consumption has priority among water uses.
6. Environmental policy will be based on the scientific evidence. However, the lack of scientific evidence cannot be used as a rationale for not acting to prevent serious irreversible harm.
7. Colombian environmental policy will rely on the use of economic instruments to incorporate environmental costs as a means of preserving the environment and conserving renewable natural resources.
8. Landscape, as part of the national patrimony, should be protected.
9. Disaster prevention is in the public interest.
10. Environmental protection is a coordinated task between the state, community, NGOs, and the private sector. The state will support the development of environmental NGOs and may delegate some governmental functions to them.
11. Environmental impact studies will be the basic instrument for deciding whether to engage in activities that may significantly affect the environment.
12. In conformance with the Constitution, environmental management will be decentralized, democratic, and participatory.
13. SINA will be created as a system for environmental management by the state and civil society.
14. State environmental institutions will be structured around the criteria of integrated management of the environment and its relationship with economic, social, and fiscal planning.

Those principles are sometimes conflicting. For example, they give biodiversity protection priority, but also say that human consumption has priority over all other uses of water. The statute gives little guidance regarding resolution of such conflicts.

3.2.2. Primary government environmental institutions

MINISTRY OF ENVIRONMENT. Law 99 created the Ministry of Environment (*Ministerio del Medio Ambiente*, MMA) to consolidate many of the principal environmental management functions dispersed throughout various branches of national government, and to provide a means of coordinating environmental management in both the public and the private sectors. MMA's principal roles in SINA are establishing national policy, developing regulations, controlling important fiscal resources, and generally planning

and coordinating environmental management (Art. 2). With the merger of the Ministries of Environment and Economic Development, all of MMA's functions and responsibilities were transferred to MAVDT.

Regarding the development of regulations, MMA is responsible for setting national environmental quality standards and criteria to be incorporated into sectoral policies established by agencies and subordinate governments. It is specifically charged with developing regulations to manage endangered species, conservation and trade of genetic material, marine resources, environmental contamination, native forests, the system of national forest reserves, and the National Parks System. As coordinator of the SINA system, it is charged with approving legal rules adopted by CARs and AAUs.

Regarding planning, MMA is required to work with DNP to develop national plans for environmental management that are to be incorporated into the National Development and National Investment Plans (Art. 5). Public participation in the process is guaranteed, although the law does not specify how this is to be accomplished. MMA also represents environmental concerns in other general governmental planning forums such as the National Planning Council and CONPES.²

Regarding fiscal policy, MMA is required to set levels for environmental fees (discussed below) and to administer the two environmental funds created by Law 99 – *Fondo Nacional Ambiental* (National Environmental Fund, FONAM) and the *Fondo Ambiental de Amazonia*.

MMA is also responsible for working with the Ministry of Education to develop and promote environmental education, and coordinating and orienting activities in the SINA research institutes (Art. 5).

Aside from its responsibilities for coordinating government activity, MMA is charged with working to align the environmental activities of nongovernmental sectors with national management goals. For example, MMA is responsible for establishing links with the private sector and maintaining a registry of environmental NGOs (Art. 5).

NATIONAL PARKS SYSTEM. Under Law 99, MMA is responsible for identifying and setting aside lands that are to be part of the National Park System and National Forest System.

² The National Planning Council is a forum for discussion of national planning issues created by the Constitution, attended both by ministers and representatives of the private sector and civil society. CONPES is a smaller forum of key public- and private-sector stakeholders. It is chaired by the president and made up of the ministers, the director of DNP, representatives of the National Bank and the National Federation of Coffee Growers, the director for Black Community Affairs in the Ministry of the Interior, and the director for Women's Equality.

The ministry has the power to expropriate or impose easements on private land for the purpose of establishing parks (Art. 5). It is also responsible for developing rules governing the function and use of the parks and for administering them to safeguard biodiversity (Art. 5). The ministry may delegate responsibility for local administration of national parks to the CAR in which the park is located (Art. 31). CARs may call on territorial governments to assist them in this effort.

REGIONAL ENVIRONMENTAL AUTHORITIES: CARs, AAUs, AND CDSS. MMA has responsibility for planning national environmental policy; CARs, AAUs and CDSSs have responsibility for implementing it. (For convenience, for the remainder of this section the term CAR will be used to refer to all three types of regional environmental authorities.) Law 99 expanded the limited CARs network that existed prior to 1993 into a comprehensive system of regional environmental authorities. Before 1993, 18 CARs covered approximately one-quarter of Colombia's territory. Since passage of Law 99, the number of CARs has been expanded to encompass nearly all geographic areas of Colombia.

Law 99 created a three-tiered governing structure for the CARs, comprising a corporate assembly (*asamblea corporativa*), a board of directors, and a director general. The corporate assembly is an oversight body made up of legal representatives of all the territorial governments in the geographic jurisdiction of the CAR. The assembly elects key members of the board of directors and the CAR comptroller, and conducts an annual financial review. The assembly also has the power to adopt CAR-level environmental regulation subject to the approval by MMA. The board of directors is the principal administrative body of the CARs. Law 99 specifies that board members include each departmental governor of the CAR territory, a representative of the president, a representative of MMA, up to four mayors elected by the corporate assembly, two representatives of the private sector, and two representatives of local NGOs. The presence of the NGO members on the CAR board of directors is meant to promote public participation in the formulation and implementation of environmental policy at the CAR level. The board is responsible for proposing new rules to the assembly, hiring, arranging external credit, determining the internal administrative structure of the CAR, approving a general plan of activities for the CAR, and naming the CAR director general to manage day-to-day operations. Prior to passage of Law 99, CAR directors were appointed by the director of DNP.

The CARs' principal roles within SINA are implementing the National Environmental Plan and enforcing national and local environmental regulation within their territories. CARs are responsible for all aspects of environmental management in their jurisdiction, including managing watersheds, forests, irrigation and flood control facilities, and nonrenewable resources. As noted above, they may also be charged with administering national parks and national forest reserves. They may enter contracts with territorial

governments to carry out these management functions. CARs have the power to grant and enforce environmental licenses and permits and provide technical assistance on environmental management to public and private entities. Law 99 charges CARs with coordinating and preparing local environmental, natural resource, and land-use plans and projects. In addition, CARs are responsible for overseeing environmental education and promoting community involvement in environmental planning and management in their jurisdictions.

Consistent with the basic concept of decentralized governance embodied in the 1991 Constitution, CARs have considerable financial autonomy. They receive a fixed percentage of property taxes collected by municipal governments. CARs also have the authority to raise their own revenue through environmental licenses, fines, and fees (discussed below).

3.2.3. Territorial governments: Departments and municipalities

Although CARs are the principal regional environmental authorities within SINA, territorial governments – mainly departments and municipalities – also play a significant role. In general, Law 99 requires both departments and municipalities to support CARs, and one another, in implementing environmental programs and projects. Both departments and municipalities must coordinate their planning activities with CARs and with the National Development Plan and must implement national environmental policy as it affects their jurisdictions.

Specifically, Law 99 mandates that departments provide financial, technical, and administrative support to the CARs and municipalities in their jurisdictions to carry out environmental programs. As discussed below, departments are responsible for monitoring and enforcing environmental regulations within their jurisdictions. They also have responsibility for managing irrigation, drainage, land recovery, and flood control in coordination with CARs and municipalities.

Law 99 mandates that municipalities develop environmental programs and projects in such areas as sanitation, wastewater treatment and solid waste disposal. Municipalities also have the power to pass ordinances necessary for environmental protection.

Finally, municipalities play an important role in monitoring and enforcing national and regional environmental regulations. Law 99 requires the National Police to create a specialized unit, the Environmental and Natural Resource Police, charged with the assisting environmental and territorial authorities in enforcing environmental and natural resource law (Art. 101). In addition, under the Constitution, mayors are responsible for supervising the National Police assigned to their municipality. CARs

depend on the cooperation of both the National Police and mayors in taking enforcement actions. Municipalities are legally required to provide this support.

3.2.4. Relationship between levels of government in SINA

Law 99 defines the relationship between the principal government entities in SINA as a hierarchical structure in which CARs and territorial governments are subordinate to MMA in environmental matters. Departments and municipalities, in turn, are subordinate to the CARs (Art. 63). Rulemaking must adhere to the subsidiary principle – that is, requirements adopted by lower levels of government cannot be weaker than nor weaken those of higher levels of government (Art. 63).

3.2.5. Other governmental authorities

NATIONAL DEPARTMENT OF PLANNING. DNP was formed in the late 1950s as cross-cutting planning and budgeting agency for Colombia's national government. Law 99 envisions DNP serving the dual function within SINA of helping to integrate (mainstream) environmental concerns into other sectors of the government and coordinating the budgets of environmental programs and investments. An environmental planning office within DNP carries out these functions.

OVERSIGHT INSTITUTIONS. Law 99 assigns Colombia's control organizations – the *Procuraduría* and the *Contraloría* – important roles in coordinating decentralized environmental management (Art. 97). Law 99 creates an office within the *Procuraduría* dedicated specifically to environmental concerns – the Delegate *Procuraduría* for Environmental Affairs (Law 99 Art. 97). This office is responsible for protecting the environment by mounting investigations and intervening in judicial, administrative, and police actions either directly or through the Public Defender's Office. Law 99 permits municipal and district councils to create local Delegate *Procuradurias* for Environmental Affairs to which the national office may delegate functions (Art. 97). As mandated in the Constitution, the *Contraloría* is responsible for fiscal oversight of all government agencies, including MMA and CARs, and for presenting an annual report to Congress on the state of the country's environment.³

The activities of the two control organizations aside, Law 99 envisions a significant oversight role for private citizens through citizen suits, participation in administrative forums, and recourse to the formal oversight bodies.

³ Under Law 42 of January 26, 1993, the *Contraloría* is also required to prepare a quantitative cost-benefit analysis of most environmental projects.

RESEARCH INSTITUTIONS. Law 99 requires that Colombian environmental laws and policy be based on the best available scientific information, subject to the precautionary principle (Art 1). To ensure that such data exist, Law 99 created a system of five research scientific institutes:

- the Institute of Hydrology, Meteorology and Environmental Studies (*Instituto de Hidrología, Meteorología y Estudios Ambientales, IDEAM*);
- the José Benito Vives de Andrés Institute of Marine and Coastal Studies (*Instituto de Investigaciones Marinas y Costeras José Benito Vives de Andrés, INVEMAR*);
- the Alexander von Humboldt Institute for the Study of Biological Resources (*Instituto de Investigación de Recursos Biológicos "Alexander Von Humboldt"*);
- the Amazonian Institute of Scientific Studies (*El Instituto Amazonico de Investigaciones Científicas, SINCHI*); and
- the Institute for Environmental Studies of the Pacific (*Instituto de Investigaciones Ambientales del Pacífico, IIAP*).

The research institutes vary in their charges and sources of funding. All but IDEAM have a specific geographic or ecological focus. IDEAM focuses primarily on data collection and analysis rather than on research and is funded mainly by the Colombian government (as opposed to private domestic or international sources such as foundations, and bilateral and multilateral aid agencies). IDEAM's role is to support both MMA and CAR activities with data, analysis, and information systems and provide an interface between SINA and the data collection activities of the national government.

NATIONAL ENVIRONMENTAL COUNCIL. Law 99 created the National Environmental Council (*Consejo Nacional Ambiental*), a supraministerial coordinating forum for consultation among all the actors of SINA. The council functions a mechanism to coordinate environmental policy with more general economic policy (Art. 14). Its decisions are advisory only. The council can create territorial councils with parallel functions. Law 99 specifies that membership of the National Environmental Council include the ministers of key ministries (who are expressly not allowed to send delegates in their stead) as well as representatives of "all affected national governmental

organizations,” the private sector, universities, and nongovernmental organizations.⁴ The minister of MMA presides over the council (Art. 13). The council is required to meet at least every six months. It may recommend measures to harmonize environmental regulation with economic and social development, measures to coordinate public and private activities, and draft regulations (Art. 14).

TECHNICAL ADVISORY COUNCIL. Law 99 also created a Technical Advisory Council (*Consejo Técnico Asesor*) attached to MMA. Its function is to assist MMA by assessing the technical feasibility of environmental projects, policies and regulations (Art. 11). It is directed by a secretary appointed by the minister of MMA. Its members include two representatives from universities, as well as representatives from industry, agriculture, mining, and the petroleum industry.

3.1.6. Instruments of governance

SINA relies on several instruments of governance that allow its component institutions to design and implement environmental policy. These include laws and decrees, enforcement actions, planning processes, fiscal instruments, and mechanisms for citizen participation (Ministry of Environment et al. 2002).

LAWS AND DECREES. Environmental law in Colombia is based principally on three documents: the 1991 Constitution, the National Renewable Resources and Environmental Protection Code (Decreto Ley 2811 de 1977 and its regulations), and Law 99 of 1993. The Constitution and Law 99 lay out the structure of the management system and create a set of planning and management instruments. The National Renewable Resources and Environmental Protection Code and its implementing decrees lay out much of the substantive content of Colombia's environmental law.

ENFORCEMENT ACTIONS. Law 99 of 1993 grants police power to MMA, CARs, and the territorial governments for the purpose of imposing sanctions to enforce environmental law (Art. 83). Law 99 provides MMA and CARs with a wide range of mechanisms for enforcing environmental laws, including warnings; fines; suspension of environmental

⁴ As mandated in Law 99, the council is to consist of the ministers of Environment, Agriculture, Health, Economic Development, Mines and Energy, Education, Transportation, Defense, and Foreign Trade as well as representatives of the major federal oversight agencies. Regional government is represented by the director of DNP, the president of the Confederation of Governors, and the president of the Colombian Federation of Municipalities. The scientific and academic sector is represented by a member of the National Council for Higher Education. CARs are represented by the president of ASOCARS, the association of CARs. Civil society is represented by three representatives from NGOs, and one representative each for indigenous and black communities. Finally, the private sector is represented by a delegate of the National Industrial Council, representatives of agricultural and mining interests, and the president of Ecopetrol.

licenses, concessions, permits, or authorizations; power to close or demolish a business; and seizure of products or equipment (Art. 85).

LICENSING. Law 99 mandates that any activity that could generate serious environmental damages or that could significantly modify the landscape requires an environmental license (Title 8). Three types of institutions – MMA, CARs, and some territorial governments – have the authority to grant environmental licenses (Art. 51). MMA is responsible for licenses for large-scale activities or activities that have a national impact (Art. 52).⁵

CARs have environmental licensing authority for projects whose impacts are limited to their geographic territory (Art. 53). CARs may delegate this power to other territorial governments in their jurisdiction (Art. 54). Municipalities and metropolitan areas with populations over 1 million have the power to grant licenses within their jurisdictions (Art. 55).

The basic procedure for obtaining a license is the same at all levels of government. When it appears that an environmental license may be needed, the party planning the activity must notify the appropriate environmental authority. The authority then determines whether an environmental impact study must be completed in order to apply for an environmental license (Art. 57). Requests for a license must be presented to the appropriate environmental authority together with an environmental impact study if one is required (Art. 58). Law 99 provides a detailed timeframe under which environmental authorities must decide whether to grant the license. Licenses may be revoked by the granting body for noncompliance (Art. 62).

PLANNING. Law 99 explicitly requires MMA to participate in development of the National Development Plan. For this reason, the minister of the agency is assigned a seat on the Council of Ministers and CONPES and is designated as the Colombian representative to international bodies addressing environmental issues of strategic importance to Colombia.

Decrees 1768 and 1865 under Law 99 require the CARs to conduct annual planning exercises and develop short-, medium-, and long-term plans. These plans are to be consistent with national environmental and natural resource planning efforts (Art. 31).

⁵ Activities that have a national impact are defined to include licenses for petroleum exploration, extraction, refining, or transportation; large mining projects; large dam projects; large energy projects; construction of large ocean ports, international airports, or other large transportation projects; construction of large irrigation districts; production of hazardous or toxic materials subject to international conventions; and projects that affect national parks, involve introduction of foreign potentially invasive species, or involve generation of nuclear energy (Law 99 Art. 52).

CARs are required to oversee environmental planning activities of the other territorial government with a goal of harmonizing environmental management in their jurisdictions. Law 99 requires that these territorial entities coordinate environmental and natural resource aspects of their broader development planning efforts with the CARs (Art. 68).

FUNDING MECHANISMS AND ECONOMIC INSTRUMENTS. Under Law 99, economic instruments are used for varied purposes: revenue generation, creation of incentives for efficient environmental management, and regulatory enforcement. At least three of the economic instruments mandated by Law 99 were ostensibly designed primarily to create incentives for efficient environmental management. First, Law 99 requires CARs to impose a retribution fee (*tasas retributativas*) on all sources of air, water or soil pollution (Art. 42). Second, CARs may impose a compensatory fee (*tasas compensatorias*) to compensate for the expenditures needed to maintain renewable resources (Arts. 42 and 43). Such fees are an explicit application of Article 338 of the Constitution, which allows the government to impose fees to recuperate the costs sustained by – or the benefits provided by – government action. Third, Law 99 requires that the national government impose a charge on all uses of water. The revenue from this charge is to be used for the protection and renovation of water resources. The charge is to be based on the social and environmental cost of water use (Art. 43). All of these fees are to be based on a measure of the environmental and social damage caused by the activity. The measure of this damage includes reduction in the value of the affected resource, social and environmental costs of any damage, and costs of restoring the affected resource (Arts. 42 and 43).

Law 99 also provides for fiscal mechanisms designed primarily to provide revenue for environmental management. First, Law 99 mandates that between 15% and 26% of municipal property tax be used to fund the environmental management activities of the CARs. At the initiative of the mayor of the affected municipality, the municipal council must determine each year the percentage of property tax to be transferred to the CAR (Art. 44). In addition, hydroelectricity generators must pay a 6% gross sales tax on sale of their power. Law 99 of 1993 specifies how these tax revenues will be allocated between the CARs and municipalities. Finally, Law 99 specifies sources of funds, including taxes, fees, and fines, that accrue to the CARs (Art. 46). All of the revenues generated by taxes created under Law 99 are subject to oversight by the *Contraloría General* and the *contralorías* of the CARs, departments and municipalities.

Law 99 also created two funds that could be used to support the work of NGOs and others in the private sector – FONAM and Fondo Ambiental de Amazonia. These funds were meant to support a wide range of environmental activities by the private sector and territorial governments.

PUBLIC PARTICIPATION MECHANISMS. Law 99 envisions a substantial role for civil society in SINA. Numerous opportunities are provided for public participation, both in the formulation of environmental policy and in its implementation and enforcement.

The primary mechanism for public participation is the policy ensuring that NGOs serve on the boards and councils of various institutions, both at the CAR level and at the national level. As noted above, Law 99 mandates that the board of directors of each CAR include two representatives of environmental NGOs (Art. 26). To be eligible to serve on the board of directors of a CAR, environmental NGOs must be sanctioned by the mayor of the municipality in which they operate (Art. 106). As discussed above, Law 99 also mandates that NGO representatives serve on the National Environmental Council and the Technical Advisory Council.

Under Law 99, the primary mechanisms for public participation in policy implementation and enforcement (as opposed to formulation) are intervention in licensing actions, public hearings over licenses, and through the court system. Any person may intervene in any administrative action to obtain or cancel an environmental license or to impose or revoke sanctions for not complying with environmental laws (Art. 69). The public must be given notice of administrative actions and has a right to intervene in them. Decisions in administrative actions affecting an environmental license must be sent to anyone who requests them (Art. 71). Public hearings on licenses or permits may be requested by an environmental authority, the *Procuraduría* or its Delegations for Environmental Matters, the public defender or governors or mayors of towns over 100 persons (Art. 72). The license or permit may not be granted until after the public hearing has been held, and the decision on the license or permit must be motivated by evidence gathered at the hearing (Art. 72). All persons have the right to petition information related to environmental contaminants that pose a threat to human health (Art. 74). All persons may also request information about the use of financial resources legally intended for environmental preservation (Art. 74).

Law 99 reinforces legal remedies established in the 1991 Constitution. Any person may demand compliance with environmental statutes or regulations in a popular action (Art. 77). MMA must be informed of all popular actions brought to enforce an environmental right and may intervene in these actions (as may the governmental entity responsible for the affected natural resource).

3.3. Major developments since Law 99

3.3.1. MMA restructuring prompted by Law 344 of 1996 and Decree 1687 of 1997

In late 1996, in response to fiscal constraints facing Colombia's national government, the Colombian legislature passed Law 344 of 1996. Its purpose was to provide the president

of Colombia with the legal authority needed to rationalize the structure of national administrative authorities in order to reduce public spending. Article 30 of Law 344 gave the president the temporary power to merge or eliminate offices within the national administrative authorities. Parts of Law 344 applied directly to SINA. In particular, Article 27 directed MMA and IDEAM to commission a study examining the structure and minimum staffing needed to complete their functions, and to rationalize their structures on the basis of this study. (Law 344 did not apply to the CARs or the environmental research institutes, since they are not national administrative authorities.) One academic stakeholder interviewed for this report commented that the legislature recognized that prior, somewhat ad hoc efforts to structure MMA by statute (Law 99 and implementing decrees) had contributed to management problems and inefficiency. To avoid repeating this mistake, the 1996 legislature required that restructuring of MMA be informed by a study.

The mandated study was completed in 1997 by Booz-Allen & Hamilton. Although it was essentially a study of MMA's management, it identified SINA's central inefficiencies as lack of coordination between MMA and the CARs and among the CARs themselves. The Booz-Allen & Hamilton report found each CAR was "independently executing its own action plan according to its own subjective interpretation of the National Environmental Plan." It noted that CARs preferred to make investments independently rather than cooperatively. The result of this independent investment was unproductive duplication of expenditures on personnel and equipment.

The Booz-Allen & Hamilton report primarily ascribed problems with CARs' implementation of national environmental policy to a lack of leadership by MMA. Although the report noted that SINA's legal underpinnings created important constraints, it mainly attributed this lack of leadership to flaws in the organizational structure of the MMA established by Law 99 of 1993 and its implementing decrees—Decree 2298 of 1993, and Decrees 1868 and 2094 of 1994. This structure had set out a system of six general directorates organized around themes—(i) liaison with CARs; (ii) human settlements and population; (iii) physical environment; (iv) forests and silviculture; (v) planning and land use planning; and (vi) environmental sectors—with a vice-ministerial branch devoted primarily to analysis and information, an administrative and legal support branch headed by a secretary general, three advisory councils, a press office, and an internal control office at the ministerial level. In addition, the National Parks System administrative unit, FONAM, and the National Fund for Environmental Action (El Fondo Para la Acción Ambiental, FAA) were attached to the ministry (Figure 1 in Appendix C). According to the Booz-Allen & Hamilton report, this structure was unnecessarily rigid and hierarchical.

The Booz-Allen & Hamilton report suggested a number of changes. Most importantly, it recommended centralizing planning in a planning and performance unit of the Minister's Office. This central MMA planning office was viewed as critical to improving MMA leadership. Furthermore, the study found that thematic organization of the directorates general led to duplication of certain functions, such as financial management and programmatic planning, and to the omission of other functions, such as ministry-wide planning. It recommended abandoning the thematic organizational structure in favor of one organized by broad functions (Figure 2 in Appendix C). Reflecting an overarching concern with coordination problems, the report recommended a ministerial-level office with two vice-ministries, one for SINA coordination and the other for policy formulation and implementation. Furthermore, it recommended that multimedia task forces under the vice-minister for policy formulation and implementation conduct policy analysis and technical support.

With minor exceptions, the Booz-Allen & Hamilton (1997) proposal was adopted as part of Decree 1687 of 1997 on rationalization of spending required by Law 344 of 1996 (Verano de la Rosa 1997). The Booz-Allen & Hamilton (1997) analysis estimated that staffing MMA as structured by Law 99 would require 423 employees, roughly 100 more than the actual MMA staff of 325. Under the newly restructured MMA, staff was reduced by 25 people, to approximately 300. The restructuring also cut the number of outside contractors by 33% and personnel service orders by 43%. MMA had historically relied heavily on contracting out functions (DNP 2002).

It is important to note that although Decree 1687 of 1997 restructured MMA, it did not change the ministry's functions as established by Law 99. Under the constitutional principal of subsidiarity, decrees cannot change the substance of laws.

3.3.2. Law 489 of 1998 and Decree 1124 of 1999

In 1998, the Colombian legislature passed Law 489 of 1998, a general administrative reform focused on modernizing and rationalizing the national administrative authorities. The stated goals of the law were to (i) democratize public management by providing greater opportunity for public participation in administrative decisions; and (ii) create greater consistency in structure across Colombian administrative agencies. The law was far more successful in achieving the first goal than the second. The remainder of this section discusses the law's provisions for achieving each goal.

Law 489 focuses on ensuring that administrative authorities develop their management in accordance with principles of participatory democracy and democratization of public management (Art. 32). Toward this end, the law holds that an authority may but is not required to convene public hearings; develop policies and programs to strengthen citizen participation; provide incentives for the formation of associations to represent

interested groups of citizens; support these mechanisms of social control; and adopt mechanisms that increase the transparency of public administration. Communities and organizations may request a public hearing, but the authority is not required to hold it, nor are the conclusions of the hearing binding on the administrative authority (Art. 33). In the process of convoking a public hearing, administrative authorities must define the procedure by which it will be conducted. Note that the law gives the administrative authorities full discretion – citizens have no guarantee of procedural rights in administrative decisions. Law 489 also requires publication in the *Diario Legal* of decrees that have been adopted by governmental authorities, but not of proposed rules or decrees (Art. 119).

In addition to democratizing management, Law 489 of 1998 also sets out the general functions of ministries (Art. 59). These include developing statutes related to the authority's area of responsibility; developing rules and regulations implementing statutes under their jurisdiction; fulfilling assigned functions and providing assigned services; preparing plans of public investment related to their sector of responsibility; coordinating and executing plans and programs with territorial governments and providing technical assistance; cooperating with and supervising territorial governments; overseeing activities of decentralized entities attached to the ministry; promoting participation of private entities and persons to provide services related to the ministries' area of competence; organizing and coordinating a sectoral committee of administrative development; and overseeing the development of a sectoral system of information.

Note that organic acts and other laws specific to a particular ministry take precedence over the general functions delineated in Law 489. Also note that the law establishes a national system of internal control for administrative authorities (Chap. VI). The law allows an administrative authority to delegate functions to other governmental entities with three exceptions: (i) adopting of generally applicable regulations (unless specifically authorized by statutes); (ii) functions that other administrative authorities have delegated to it; (iii) functions that by their nature or constitutional or statutory mandate cannot be delegated (Art. 9).

Given its provision on administrative structure, Law 489 provided the impetus for another restructuring of MMA. This restructuring was intended to address problems of coordination among the government entities of SINA. It has not succeed in achieving that end, however. Under Decree 1124 of 1999, MMA was restructured for a second time. The decree revised or eliminated many, if not most, of the major elements of the previous restructuring. It abolished the Vice-Ministry for Coordination of SINA and moved the Directorate of SINA Planning and Management, as well as most functions of the Directorates of the Vice-Ministry for Policy and Regulation, into a single, generic vice-ministry. MAVDT staff interviewed for this report commented that the separate

Vice-Ministry for Coordination of SINA was abandoned because MMA could not identify effective mechanisms for coordinating SINA activities. As required by law, the administrative functions included in the previous structure (i.e., the structure established by Decree 1687 of 1997) were also included in Decree 1124 of 1999 (Figure 3 in Appendix C). However, the ministerial-level advisory body for planning and programming recommended in the Booz-Allen & Hamilton report was eliminated.

3.3.3. Changes in the planning process: Decree 48 of 2001

Coordinating planning efforts has proven a central challenge in implementing Law 99. Law 99 required the CARS to develop short-, medium-, and long-term plans. By 1999, however, only a third of the CARs had developed the capacity to conduct these exercises. In 1999, DNP and MMA undertook a formal consultation to evaluate CARs' planning. The consultation concluded that CARs tended to conduct planning exercises simply to fulfill their legal obligations rather than to actually orient resource management. The DNP-MMA consultation also noted little consistency in the methods CARs used to develop their long-term and medium-term plans, and little relationship between these two efforts. Finally, it identified a tendency for the CARs to formulate goals that were not easily quantifiable. As a result, MMA evaluation of the success of CAR management efforts was difficult (Decree 48 of 2001).

In response to the 1999 DNP-MMA consultation, MMA began a process of strengthening regional environmental planning. The new approach provides explicit guidelines on the content of long-, medium-, and short-term plans. It requires each CAR to draft a 10-year action plan (*plan de gestión ambiental regional*, PGAR) that is coordinated with the National Development Plan drafted by the executive branch. In addition, each CAR director general is required to draft a 3-year action plan (*plan de acción trianual*, PAT) covering his or her three-year tenure, as well as annual investment operating plans (*planes operativos anuales de inversiones*, POAIs) for each year of the term.⁶ The reforms in the planning process extend to the departments, municipalities, and districts as well. These entities are required to formulate development plans that take into consideration the CARs' PGAR.

⁶ The PATs must contain (i) a general statement of the long-term vision for environmental management in the CAR, objectives of the CAR administration and strategies for coordinating CAR actions with national policies, the PGAR, and territorial plans; (ii) an evaluation of environmental conditions in the CAR that follows diagnostic guidelines developed in the PGAR; (iii) a plan of actions and programs that will carry out the 10-year plan; (iv) a program-by-program financial plan with an annual projection for revenues and expenditures identifying specific sources of revenue; and (v) a process of monitoring and evaluation with indicators that permits the CAR to monitor progress toward and completion of established objectives and goals (Decree 48 of 2001). The POAI must specify concrete projects and specific actions that will be undertaken to carry out the triennial plan. These actions include both investment and monitoring and enforcement. The POAI links the planning process to the CARs' annual budgeting process.

3.3.4. Merger of the Ministry of Environment and the Ministry of Development: Law 790 of 2002 and Decree 190 of 2003

An important plank in Alvaro Uribe's election platform was reducing the size of the national government to reduce mounting fiscal deficits. After Uribe took office, the Colombian legislature passed Law 790 of 2002 authorizing the president of Colombia to merge national administrative entities to improve administrative efficiency and pursue fiscal austerity, among other reasons.

In response to Law 790, DNP conducted a study of the basic functions of MMA as laid out in Law 99. The study found substantial overlap and complementarity between MMA's responsibilities and those of the Ministry of Housing and Economic Development (*Ministerio de Vivienda y Desarrollo Económico*, MVDE), which addressed basic sanitation, potable water, urban environmental quality, and human settlement and land-use planning (DNP 2003). DNP argued that Colombia's environmental management was still insufficiently integrated into economic development planning processes. In rural areas, DNP found that MVDE did not pay sufficient attention to the role that natural resources could play in increasing income and improving rural quality of life. DNP also identified a tendency for MVDE water policy to focus on construction of sanitation infrastructure, and not enough on the supply of and demand for environmental services, including the limited capacity of the ecosystems that supply these services. DNP also found that Colombian land-use planning failed to look at the interrelationship between rural environmental quality and urban development. On the basis of the need to promote such complementarities, DNP recommended merging MMA with MVDE to form the Ministry of the Environment, Housing and Territorial Development (*Ministerio del Ambiente, Vivienda y Desarrollo Territorial*, MAVDT). The merger was formalized by Decree 190 of 2003 (Figure 4 in Appendix C).

3.4. Analysis

Colombia's environmental management system evolved gradually to reflect a changing public understanding of the function of the environment. As discussed in Section 1, by the late 1980s, several critical problems remained. The existing system of regional environmental authorities – CARs – did not cover the entire country. Environmental management in areas without such authorities proved problematic. CARs themselves had conflicting functions: they were charged both with protecting the environment and with promoting economic development. INDERENA was relatively weak and underfunded. Responsibilities for environmental management at the national level remained dispersed among different national authorities. INDERENA's location within the Department of Agriculture gave rise to some of the same conflicts of interest that confronted CARs and also perpetuated a tendency to prioritize rural environmental issues over urban issues, even though Colombia was increasingly urbanized. Finally, the legal underpinnings of environmental management were clearly inadequate.

On their face, Law 99 and the 1991 Constitution appear to have created legal mechanisms for addressing many of the problems Colombian environmental management faced prior to their passage. They established environmental management as a regular part of government activity throughout the country. They developed a relatively stable, independent system for financing environmental management and investments. Together with Decree 48 of 2001, they established a systematic process for coordinating national and local environmental planning. Within the limitations imposed by the unitary government created by the 1991 Constitution, they provided a mechanism to adapt environmental policy to regional differences in ecology and economic development.

In actuality, however, both the legal structure itself and its implementation leave many of these problems unresolved. In Section 6 below, we review evidence on the performance of the environmental management system created by the 1991 Constitution and Law 99. To foreshadow that discussion, in this section we briefly discuss two characteristics of SINA's legal underpinnings that give rise to environmental management problems.

First, the design of Law 99 virtually ensures inadequate national-regional coordination. As mandated by Law 99, CARs have responsibility for implementing national policy at the local level. Yet a number of design features tend to inhibit this function. Most important, CARs have considerable fiscal and political autonomy – they have locally elected leaders and significant revenue streams that are independent of the national government.⁷ The Constitution and Law 99 provide limited mechanisms for national control over CARs' activities, including new, stronger planning requirements, some national control over budgets, representation of national authorities in CARs' boards of directors, the control organizations, and some co-financing. As discussed in Section 6.1.3, however, each of these coordination mechanisms is problematic. (Recent efforts at developing a coordinated national and regional environmental planning process appear useful.) Finally, CARs are not truly democratic local governments accountable primarily to local citizens, who might provide stronger electoral oversight of their activities.

It appears to us that the Booz-Allen & Hamilton report, as well as subsequent reforms, may have inappropriately attributed chronic SINA coordination problems to administrative inefficiency and lack of leadership from MMA. Although MMA management may indeed be weak, as noted in the beginning of the Booz-Allen &

⁷ In this sense CARs embody elements of a unitary system of governance and a national system of governance, without really falling into either category – a structure that inevitably creates conflict and confusion. CARs are neither regional administrative offices of a national environmental ministry nor local governments.

Hamilton report, tensions inherent in the structure of governmental relationships established in the 1991 Constitution and Law 99 appear to be the root cause of poor national-regional coordination. Specifically, this tension is embodied in the contradictory desires for autonomous, regional environmental administration and national-level policymaking. Therefore, whatever their merit in terms of administrative efficiency, attempts to modify MMA's structure (as was done by Decree 1687 of 1997, Decree 1124 of 1999, and Decree 190 of 2003) without changing basic functions of SINA institutions are unlikely to resolve coordination problems. These problems of coordination and accountability, as well as some possible mechanisms for addressing them, are discussed further in Sections 6 and 9.

On a related issue, it is worth pointing out that the main responsibilities that Law 99 assigned to MMA are the standard responsibilities assigned to national environmental regulatory agencies. Hence, in our opinion, MMA management problems are not primarily the result of the ministry being overburdened with functions. Instead, the problem is that they have very few means of overseeing implementation by financially independent CARs. National environmental regulatory bodies in other countries, such as the United States, have similar administrative responsibilities, but they have a stronger set of oversight mechanisms, including both incentives, such as cost-sharing, and punishments, such as the power to withdraw state governments' power to implement national environmental programs. Section 7 discusses at length U.S. mechanisms for federal-regional coordination.

Tension between national authority and regional autonomy aside, a second characteristic of SINA's legal underpinnings that gives rise to environmental management problems concerns public participation. Even though one of main aims of both the Constitution and Law 99 was to create a participatory, democratic environmental management structure, the legal mechanisms for public participation that these laws create are inadequate. For example, Law 99 mandates representation of nongovernmental organizations on major boards of directors and advisory bodies. Yet there is little in the structure to guarantee that this participation is meaningful and free from capture by either political interests or an administrative authority. Furthermore, although Colombia's general administrative code allows administrative agencies to develop procedures for public participation, it provides no guarantees that such procedures will be adopted or used effectively. In general, administrative authorities have considerable discretion over public participation. For example, Law 489 leaves the convocation of public hearings on matters other than environmental licenses (which, under Law 99 anyone can call for) to the discretion of the administrative authority.

More importantly, however, neither Law 489 nor Law 99 provides the legal underpinnings for a meaningful process of prior notice and comment. The Colombian Constitution recognizes the need for citizens in a democracy to be informed about

deliberations over new laws by requiring that proposed legislation before Congress be published in the *Dario Legal*. However, there is no legal requirement that the public be informed that an administrative authority is contemplating development of rules of general applicability that, like laws passed by Congress, will be legally binding. In addition, there is no requirement that the administrative authorities give the public an opportunity to comment on proposed laws and rules, or that they consider these comments in making their decisions.

In general, public participation in a democratic system requires open access to the rulemaking process. It is not possible to know *a priori* who in the public will be affected by a new law. Experience in other countries has shown that public input into environmental rulemaking is needed for good environmental governance, not only to ensure fair representation of civil society, but also because environmental regulators require technical information that is in the hands of members of the public – including regulated industry and scientists.

Finally, as will be discussed further in Chapter 6, although the merger of the Environment and Economic Development ministries creates some opportunities for better environmental management, it also poses significant risks. There are two primary concerns: (i) creating conflicts of interest between the economic development and environmental protection functions of the new ministry, similar to those experienced under INDERENA; and (ii) a reduction in the prominence and import of environmental issues in governmental forums and decisionmaking.

4. SINA's Finances

4.1. Sources of funds

4.1.1. Overall funding

Total public-sector spending for SINA is relatively low. The World Bank recommends that developing countries spend between 1.4% and 2.5% of gross domestic product (GDP) on the environment. In Colombia, total public-sector spending on the environment – including spending by CARs, MMA, and the research institutes – averaged just 0.38% of GDP between 1995 and 2002, rising from 0.34% in 1995 to 0.37% in 2000 (*Contraloría* 2002a, 458–59).

4.1.2. National funds

Historically, the national government has been an important source of funding for SINA. From 1995 to 2002, the national government contributed 31% of SINA's total funding. It contributed 47% of SINA's operations funding and 25% of its investment funding (Table 1). MMA has responsibility for allocating these funds to various SINA entities.

**Table 1. Financing of SINA entities, 1995–2002
(millions of pesos)**

Purpose	National contribution	Self-generated resources	Total
Operations	606,504	740,401	1,346,905
Debt service		53,448	53,448
Investment	697,940	2,111,569	2,809,509
TOTAL	1,304,444	2,905,418	4,209,863
%	31	69	100

(Source: Gómez Torres 2003)

Although the figures in the previous subsection indicate that *total* spending increased slightly during the second half of the 1990s, they mask significant changes in levels of spending by the national government versus CARs: total national spending on the environment declined significantly while (as discussed below) spending by CARs increased. National investments in the environment – a subset of total national spending – declined 78% between 1995 and 2003.

That seemingly significant decline in national spending was mainly due to a significant but temporary infusion of external funding just after SINA was established. Between

1994 and 1996, Colombia obtained US\$240 million in loans targeted at the environmental sector from the World Bank and the InterAmerican Development Bank for spending on the environment. The majority of these loans were for specific investments (reforestation and strengthening environmental management of AAUs), however, not for operations.

4.1.3. Self-generated funds

As discussed in Section 3, Law 99 provides some SINA entities with tax and fee mechanisms designed to build financial independence. By relying on these mechanisms, some entities have (thus far) emerged relatively unscathed from the national fiscal crisis. However, these self-financing mechanisms primarily benefit just one type of SINA institution – CARs. In fact, 98% of SINA's self-generated (versus national) resources are concentrated in the CARs (Tables 2 and 3).

Moreover, resources are unequally allocated among the CARs themselves. Almost three-quarters of SINA's self-generated revenue accrues to just 8 of Colombia's 33 CARs.⁸ The ability of CARs to generate revenue from taxes and fees depends critically on levels of population, economic activity, and natural resources within the CARs. Not surprisingly, then, those CARs with the most economic activity and highest population densities generate the most revenue. CARs without these resources have historically been dependent on national funding and have been hard hit by the fiscal crisis.

There is also a considerable disparity in financial resources available to the 18 CARs that existed before Law 99 and to those that were created by the law: 90% of CAR investment takes place in CARs that predate Law 99.

Despite those inequities in the allocation of financial resources, some of the 8 CARs with the largest self-generated incomes still receive contributions from the national budget. No clear criteria exist to assign operational funds to the 26 CARs that receive partial funding from the national government.

Mechanisms do exist to even out disparities in CAR revenues. The Environmental Compensation Fund was created in 1996 to redistribute self-generated CAR revenue from wealthier CARs to the 15 poorest. All CARs, except the CDSs, must contribute 20% of their electricity sector transfers and 10% of certain other self-generated resources to the fund. In addition, the National Environment Fund (FONAM) was also meant to finance investments in poor CARs. Finally, national authorities can direct funds to CARs via the National Royalty Fund established under the 1991 Constitution.

⁸ The eight CARs are CAR, CVC, CDMB, CORANTIOQUIA, CORNARE, CRC, CORTOLIMIA, and CRA.

Unfortunately, the mechanisms do not appear to be very effective. FONAM has not been able to meet its objectives because of a lack of funding. Gómez Torres (2003) attributes this failure to the current fiscal crisis and MAVDT's inability to obtain funds for FONAM from outside sources. Moreover, she demonstrates that FONAM mainly supports older, better-endowed CARs. The National Royalty Fund has also been troubled. It is subject to wide pro-cyclical swings in availability and has been characterized by piecemeal division among localities, regions and departments and, overall, by poor-quality proposals (Gómez Torres 2003, 45–49).

4.2. Primary SINA institutions

4.2.1. Ministry of Environment, Housing and Territorial Development

Between 1995 and 2002, 13% of SINA funding for operations and 9% of SINA funding for investment was allocated to MMA (Tables 2 and 3). All of this funding – 100% – was a national appropriation. The ministry generates some of its own revenue through fees for licenses and permits. However, by law, such fees can compensate MAVDT only for the cost of providing these services. Between 1995 and 2002, 28% of national funding for operations and 33% of national funding for investment were allocated to MMA (Tables 2 and 3).

Table 2. Distribution of funding for operations among SINA entities, 1995–2002 (millions of pesos)

Entities	National contribution	Self-generated resources	Total	%
MMA	170,359	0	170,359	13
Nt'l. Parks System	51,303	0	51,303	4
CARs	209,207	740,401	949,610	71
Research institutes	175,635	0	175,635	13
TOTAL	606,504	740,401	1,346,907	
%	45	55		100

(Source: Gómez Torres 2003)

Table 3. Distribution of funding for investment among SINA entities, 1995–2002 (millions of pesos)

Entities	National contribution	Self-generated resources	Total	%
MMA	242,464	0	242,464	9
UAESPNN	40,742	515	41,257	2
CARs	330,796	2,072,369	2,403,164	85
R'srch. institutes	71,336	15,577	86,913	3
FONAM	27,832	23,108	50,940	2
Other	12,531	0	12,531	0.4
TOTAL	725,701	2,111,569	2,837,270	
%	26	74		100

(Source: Gómez Torres 2003)

4.2.2. CARs

Between 1995 and 2002, 71% of SINA funding for operations and 85% of SINA funding for investment were allocated to CARs. Fully 78% of the funding for operations and 86% of funding for investment were self-generated (Tables 2 and 3). Total revenue generated by CARs grew by 89% between 1995 and 2002. As discussed in Section 3, CARs can use a variety of mechanisms to raise revenue, including property taxes, electricity taxes, effluent fees, compensatory fees, water use fees, licenses and permits, fines and sanctions, the sale of goods and services, profits on investments, and interinstitutional agreements. Of these sources, property taxes account for 35% of total revenues, profits on investments account for 34%, electricity taxes account for 10%, interinstitutional agreements and the sale of goods and services combined account for 10%, and effluent fees account for less than 2%. Property tax revenue grew significantly (by 127%) between 1995 and 2001.

4.2.3. AAUs

From 1996 to 1998, AAUs received funding from three main sources: revenue generated through the mechanisms established under Law 99 (principally property taxes); transfers from municipalities for environmental management support; and national contributions, which were divided between US\$20 million in credits from the World Bank for capacity building, and ordinary funds from the MAVDT budget. Property tax revenues and the World Bank credits were the largest funding sources.

After 1998, however, those sources of funding were substantially reduced. The Constitutional Court declared unconstitutional Article 9 of Decree 1339 of 1994, which had granted AAUs half of the property taxes raised by municipalities.⁹

From 1995 to 1998, AAUs' self-generated resources totaled 188,755 million pesos, of which 86% was generated by the Bogotá Urban Environmental Authority (DAMA), 11% by the Cali Urban Environmental Authority (DAGMA), 2% by the Barranquilla Urban Environmental Authority (DADIMA), and 1% by the Aburrá Valley Urban Environmental Authority (AVMA). DAMA's disproportionate allocation results from a special transfer that entities within its jurisdiction are required to make for environmental investment. All of DAMA's funds from property taxes are dedicated exclusively to the Río Bogotá decontamination project. DADIMA's and AVMA's low allocations are mainly the result of a recent decision by the cities of Barranquilla and Medellín not to transfer property taxes to the AAUs, a noncompliance issue that has sparked a legal battle.

After 2000, the AAUs stopped receiving national funds. This, combined with their limited ability to generate their own resources, has placed them in an precarious financial situation.

4.2.4. Research institutes

Between 1995 and 2002, 13% of SINA funding for operations and 3% of SINA funding for investment was allocated to research institutes. Fully 100% of the funding for operations and 82% of funding for investment was a national appropriation (Tables 2 and 3). Of the national funds allocated to the research institutes, three-quarters goes to IDEAM.

Some of the research institutes have managed to insulate themselves from the budget crisis by seeking outside funding, mainly from international organizations. From 1995 to 1998, national funding financed 83% of the research institutes' new investments. Yet from 1998 to 2002, as the institutes diversified their funding base, this contribution dropped to 49%. Collectively, research institutes' investments actually grew by 86% from 1998 to 2001. Despite this success, the research institutes have considerable difficulty financing operations with funds generated on their own, since international funders often place severe restrictions on using funds for operations.

⁹ The court decision held that these resources must be invested in the urban perimeter, but CARs – not AAUs – are responsible for this investment.

4.2.5. National Parks System

Between 1995 and 2002, 4% of SINA funding for operations and 2% of SINA funding for investment was allocated to the National Parks System. National appropriations account for 100% of the funding for operations and 99% of funding for investment (Tables 2 and 3).

The National Parks System has faced serious financial problems in recent years. Between 1995 and 2002 the parks reduced general spending by 63% and investment by 37%. Although the system has some ability to generate its own revenues from ecotourism fees and concessions, these resources are small and highly sensitive to the state of public safety.

The National Parks System is trying to develop revenue streams that remunerate the system for environmental services it provides, including carbon sequestration, biodiversity conservation, and watershed protection. It hopes to generate revenues from carbon sequestration by participating in the Clean Development Mechanism of the Kyoto Protocol. Current law allows parks to charge a tax for water use, but this mechanism requires further legal clarification before it can be implemented. The National Parks System has been able to raise significant international funds, primarily for biodiversity conservation. For example, between 1996 and 2000, the system received 5,800 million pesos in Dutch donations aimed at developing protection, conservation, and management actions in eight parks in the Pacific region. It is worth noting in this context that Colombia has copious biodiversity. Although the country accounts for only about 0.7% of the world's continental surface, it hosts 10% of the world's biodiversity (Ministry of Environment et al. 2002).

4.3. Environmental funds

Colombia has four semi-independent funds that finance investments and institutions in the environmental sector.

4.3.1. National Royalty Fund

The 1991 Constitution creates a National Royalty Fund (Fondo Nacional de Regalías, FNR) from the proceeds of a tax on the exploitation of non-renewable resources (Art. 360-1). Under Law 141 of 1994, 32% of the revenue from this tax goes to this fund.¹⁰ FNR is administered by the National Royalty Commission composed of five governors,

¹⁰ The remaining 68% goes directly to territorial and municipal governments in areas directly affected by the resource exploitation.

seven mayors, and the ministers of Mines and Energy, Transportation, and MAVDT. The governors and mayors on the commission are elected by their peers. Each minister may send a vice-minister in his or her stead. The director of DNP presides over the commission.

A number of issues detract from FNR's ability to function as an environmental fund. First, its focus is not the environment – it mainly finances economic development, not environmental protection. Legislation dictates in considerable detail how FNR is to distribute its funds among specific groups of CARs and specific kinds of projects (Law 141 of 1994; Law 344 of 1996; Law 756 of 2002). Originally, a minimum of 20% of the fund's investments had to be focused on environmental quality (Law 141 of 1994). In 2002, new legislation changed this percentage to 30% (Law 756 of 2002). In the four years between 1999 and 2002, FNR funded 378 projects related to environmental protection. These projects were valued at 121,142 million pesos, or an average of 30,286 million pesos (US\$12 million) per year. This sum represents less than 10% of CARs' annual investments from self-generated revenue (Table 3).

Second, most of FNR's environmental projects have been focused on one area – forestry. Of FNR's investments in the environmental sector between 1999 and 2002, 53% were devoted to reforestation, 20% to wastewater treatment, and 13% to solid wastes. Finally, Gómez Torres (2003) notes that, in part because of the specificity of laws governing the allocation of the funds, FNR has been characterized by "excessive fractioning between project destinations in the localities, regions and departments and, overall, by poor-quality proposals, which reduce the cost-effectiveness of investments" (45-49).

4.3.2. National Environmental Fund

Created by Law 99 and subsequent decrees, FONAM is a national environmental fund charged with promoting environmental decentralization and private-sector participation in environmental management (Law 99 of 1994 Arts. 87-90; Decree 1602 of 1996). FONAM is a semi-independent institution affiliated with MAVDT. It is administered by a representative of DNP, the minister or vice-minister of MAVDT, the director of ECOFONDO, an academic representative, and technical directors of MVDT. By statute, FONAM must give priority to projects in poorer regions.

Law 99 allows FONAM to use funds from three sources: national appropriations, international loans and debt-for-nature swaps. Historically, however, most of FONAM's funding has come from the InterAmerican Development Bank (IDB). National funds have been sufficient to cover only FONAM's costs of administering IDB loans. Projects funded under FONAM helped MMA promote coordinate national environmental policy.

Unfortunately, FONAM no longer appears to be very effective. Since 2002, FONAM has been without external funding. National funding sources designated under Law 99, principally National Parks System user fees and fees and fines from environmental licenses, have not provided a sustainable funding base.

4.3.3. Environmental Compensation Fund

The Environmental Compensation Fund (*Fondo de Compensación Ambiental, FCA*) was created in 1996 to redistribute financial resources generated by CARs in such a way as to decrease the concentration of financial resources in a few CARs (Law 344 of 1996, Decree 954 of June 1999).¹¹ All CARs, except the CDSs, must contribute 20% of their electricity sector transfers and 10% of certain other self-generated resources to the fund. Funds are redistributed in response to semiannual proposals from the 15 CARs with the lowest income in the current fiscal period. The fund is administered by MAVDT and a committee of five members – representatives of MAVDT, DNP, the CARs, and the CDSs.

The fund began operation in 1999 and by 2002 had disbursed 25,379 million pesos. The fund grew steadily between 1999 and 2002, from roughly 1,588 million pesos in 1999 to 8,662 million pesos (US\$3 million) in 2002. On average, approximately 30% of the fund is used for operational expenses, and the remainder for investments. The fund has been critical in maintaining the viability of some of the poorer CARs, particularly those in depressed areas of the northern coast, Amazonía and Orinoquía.

4.3.4. National Fund for Environmental Action

The National Fund for Environmental Action (*El Fondo Para la Acción Ambiental, FAA*) was established in 1993 under a bilateral agreement between Colombia and the United States as part of the Initiatives of the Americas. FAA was funded by a debt-for-nature swap in the early 1990s with the goal of promoting preservation or protection of natural and biological resources in Colombia. FAA was intended primarily to fund small projects by NGOs.

From 1993 through 1997, FAA was administered by ECOFONDO. In 1996, it approved 11 projects valued at 402 million pesos, and in 1997 it approved 35 projects valued at 2,680 million pesos. In 1997, operation of FAA was suspended because of problems in its implementation. In March 2002, the United States and Colombia reached agreement that allowed FAA to resume operations under the direction of a new board – the

¹¹ The fund was premised on the idea that some of the poorest CARs provide other CARs with environmental services without receiving financial compensation.

Council of the Americas – composed of representatives of the private sector, universities, the U.S. government, MAVDT, DNP, and five representatives of NGOs that work on environmental issues, community development, and child development.

By agreement with the U.S. government, FAA is required to spend the capital it had accumulated through 2002 on projects over a four-year period. This spending is a precondition for a new debt-for-nature swap under the Initiative for Tropical Forests. In 2001, FAA approved 30 projects valued at 7,731 million pesos, and in 2002 it approved 81 projects valued at 56,325 million pesos.

5. State of the Environment and Environmental Indicators

This section presents brief overviews of the state of the environment in Colombia and the status of efforts to track environmental quality. The information in this section was derived from a number of reports, including the *Contraloría* "State of Natural Resources and the Environment" reports for 2002 and 2003, SIAC's "Profile of the State of Natural Resources and the Environment in Colombia" for 2001, and various data assembled by Esterling Lara (2004).

5.1. State of the environment

In general, only limited data on environment quality in Colombia are available, and those data that do exist are often inconsistent and incompatible. The *Contraloría* reports that "Colombia doesn't have a baseline that allows for determination of the state of, and changes in, the quality and quantity of natural resources and the environment over time; for example, reliable statistics do not exist on the state of natural resources, the pressure exerted on them and the occasioned response, which makes difficult follow-up and evaluation of national and state management in preserving it" (2002b, 7).

Despite the gaps and inconsistencies in the data, there is still clear evidence of a progressive deterioration of the environment and degradation of natural resources. The *Contraloría* warns, "by continuing in this manner, we could cease to be one of the planet's most mega-diverse countries" (2002b, 24).

5.1.1. Forests

Colombia has experienced significant and rapid deforestation in recent decades. Forests are currently estimated at roughly half their original size. The *Contraloría* (2002b, 114) points out that estimates of the rate of deforestation vary widely, from 600,000 hectares per year (Agustín Codazzi Geographic Institute) to 91,932 hectares per year (IDEAM). Such variation suggests varying data collection methodologies. Certain types of forests have been particularly affected. According to the *Contraloría* (2003b, 24), mountainous forests have been reduced by 73% to 90%, and dry tropical forests by more than 95%.

The major factors responsible for deforestation in Colombia have been expansion of agriculture, ranching, and colonization (73%); lumber production (12%); firewood consumption (11%); illicit crop production (2%); and wood fires (2%) (Ministry of Environment and DNP 1997. See also *Contraloría* 2002b, 24).

Overall, between 35% and 40% of the territory of Colombia has been "drastically altered" by human action. Impacts vary across regions. The most affected areas are

along the arid peri-Caribbean belt, the Sierra Nevada, and the North Andean regions. Of the country's five largest watershed basins, the East Caribbean watershed has been almost completely transformed, with only 21% of its natural vegetative cover remaining. The Amazon and Guayana regions are best preserved: more than 87% of their original cover remains. The largest remaining expanse of forest cover is found in the Amazon and Pacific regions (*Contraloría* 2002b, 23).

Loss of forest cover causes a variety of environmental problems, including loss of biodiversity, destabilization of aquifer sources, and soil erosion. The loss of natural habitats in Colombia, one of the most biodiverse countries in the world, is resulting in a rapidly growing list of endangered species. Of all registered species, 21% of reported mammals are classified as threatened, 8% of birds, and 4% of reptiles (SIAC 2002a, 290).

5.1.2. Impacts of illegal crops

Destruction of natural vegetation from illegal coca and poppy crops has increased in recent years. In 1998, coca crops destroyed an estimated 292,800 hectares of vegetation (including forests, savanna, and other ecosystems), and poppy crops replaced natural vegetation on an estimated 15,250 hectares. In 2001, the pace of destruction increased—579,228 hectares was planted to coca crops and 10,683 hectares was planted to poppy crops (SIAC 2002a, 332).

The chemicals used to produce and fumigate illicit crops may have significant environmental impacts, including contaminating soil and groundwater. Although government studies on the environmental impact of using glyphosate to fumigate illicit crops are lacking, nongovernmental research suggests that it causes a significant increase in ear, skin, respiratory, gastrointestinal, and other medical problems and can present a risk for endangered plant species and provoke soil erosion and salinization (Nivia 2001; SIAC 2002a, 335; Garfield and Arboleda 2003, 49). The *Contraloría* (2003a, 89) highlights concern that glyphosate has been used on illicit crops for more than a decade without corresponding research to determine its impacts on the environment. Recent efforts to fumigate illicit crops in national parks have attracted particular controversy. The 49 natural parks directly supply potable water to 31% of the population and include more than 62% of the national aquifer sources (UNEP 2004).

5.1.3. Soil

The Agustín Codazzi Geographic Institute and the Ministry of Agriculture classified 24% of Colombia's soil as "overused" and 7% as "severely overused" (SIAC 2002a). Of the total land area, 93% is at high risk of compaction, 47% is affected by soil erosion, 4% by desertification, and 9% by salinization (SIAC 2002a, 303).

5.1.4. Air quality

Air quality analysis typically focuses on urban areas, where Colombia's population, automobiles, and industry are concentrated. As discussed in Section 5.2 below, 17 of Colombia's cities and industrial corridors have some type of air quality monitoring network (including Bogotá, Area Metropolitana del Valle de Aburra, Bucaramanga, Cali, Tolima, and Santa Marta City). Unfortunately, these networks lack standardized data collection methodologies and have yet to be integrated (SIAC 2002b).

Table 4 summarizes monitoring data for Bogotá, Valle de Aburra, and Bucaramanga. Particulate air pollution in all three cities is clearly a serious problem. SIAC data for Bogotá support this conclusion. In downtown Bogotá in 2001, air quality on 71% of all days was classified as "unhealthy, air quality on 15% of days was classified as "very unhealthy," and air quality on 12% of days was classified as "dangerous." On only 2% of days was air quality classified as "moderate" (SIAC 2002b, 191).

Table 4. Average annual concentrations of conventional air pollutants by city and monitoring area

City and monitoring area	PM10 (ug/m3)	TSP (ug/m3)	NO ₂ (ppb)	SO ₂ (ppb)	CO (ppm) [†]
Bogotá					
Commercial centers	74*	102*	9	10	4
Downtown	36	102*	20	14	3
Industrial areas	68*	158*	21	29	6
Traffic areas	65*	118*	14	16	6
Residential areas	64*	102*	12	14	5
Valle de Aburra					
Commercial centers	58	80	39	15	n/a
Downtown	60*	97*	47	20	n/a
Industrial areas	58	80	39	15	n/a
Traffic areas	58	87	41	14	n/a
Residential areas	58	82	30	15	n/a
Bucaramanga					
Commercial centers	47	n/a	17	5	1
Downtown	69*	n/a	24	7	2
Industrial areas	58	n/a	13	4	1
Traffic areas	62*	n/a	20	6	1
Residential areas	52	n/a	15	5	1
DAMA standard	60	90	52	30	10

PM10 = particulate matter smaller than 10 micrograms

TSP = total suspended particulates

NO₂ = nitrogen dioxide

SO₂ = sulfur dioxide

CO = carbon monoxide

† = 8-hour standard

* = exceeds DAMA standard

(Source: Esterling Lara 2004)

Table 5 presents data on the sources of total emissions of conventional pollutants in 1996. Thermal electricity generation was the leading source of sulfur oxides and nitrogen dioxide. Industry was the leading source of particulate pollution and a major source of sulfur oxides. Transportation was the leading source of hydrocarbons and carbon monoxide.

Table 5. Sectoral contributions to 1996 total emissions of air pollutants (%)

Sector	Particles	Sulfur oxides	NO ₂	Hydrocarbons	CO
Electricity generation	7	43	66	1	6
Industry	48	41	21	11	7
Transport	4	5	8	77	83
Residential	41	11	6	10	4
TOTAL	100	100	100	100	100

(Source: Planning Unit of Mining and Power. Environmental Impact Module for 1996)

More recent data suggest that transportation is the leading source of several air pollutants. Specifically, it is responsible for 98% of total emissions of carbon monoxide, 90% of total emissions of volatile organic compounds, and 66% of total emissions of nitrogen oxides. The high level of emissions from mobile sources results from accelerated growth of automobile use, deficient vehicle maintenance, and poor fuel quality. Fixed industrial sources, which rely heavily on fuels with high sulfur content, are the leading emitters of sulfur dioxide and particulates. They are responsible for 87% of sulfur dioxide emissions (SIAC 2002a).

5.1.5. Water

WATER QUANTITY. Colombia is a relatively humid country with highly varied topography. Yet water resources are growing increasingly scarce in some parts of the country. Water resources are classified as highly scarce in 11 municipalities with nearly 1.2 million inhabitants. These municipalities are mainly located in parts of the Magdalena and Cauca watershed basins and along the Caribbean coast. The *Contraloría* (2002b, 25) states that although the situation is not currently urgent, in the medium term it will become more critical. By 2016, it is projected that 19% of all municipalities, containing 38% of the urban population, will face significant water scarcity problems.

WATER QUALITY. High population and industrial density in the Andean region have led to significant water quality problems. For example, the Cauca and Magdalena rivers have high levels of pollution, and the Bogotá River is reputed to be one of the most polluted rivers in the world. Large urban centers like Cali, Bogotá, Medellín, Barranquilla, Cartagena, and Bucaramanga are the most significant contributors to high biological oxygen demand (BOD) levels. Although Colombian regulatory agencies monitor BOD and total suspended solids (TSS), they do not monitor chemical oxygen

demand or sanitary pollutants such as fecal coliform, which are particularly harmful to human health (*Contraloría* 2003b).

Both industrial and domestic wastewater contributes to water quality problems. For example, in 1999 the domestic sector was responsible for 74% of BOD in all wastewater, and the industrial sector was responsible for 26% (SIAC 2002a). The vast majority of industrial wastewater is not treated. Aside from industry and households, agriculture is also a leading contributor to water pollution. Colombia's extensive use of agrochemicals exacerbates this problem. In 1991, agrochemical consumption reached 9.8 kilograms per hectare, a far higher rate than in the United States, where consumption averages 6.8 kilograms per hectare. Finally, mining contributes to water pollution. In particular, gold mining has resulted in the release of large quantities of mercury (SIAC 2002a).

5.1.6. Sanitation

More than 70% of Colombia's population is concentrated in urban centers, and 40% of the urban population is concentrated in just four cities (Bogotá, Medellín, Cali, and Barranquilla). Moreover, most cities are in the Andean zone at an altitude above 1 kilometer. This concentration of people in mountainous areas has significant environmental implications, especially for the supply of potable water (*Contraloría* 2002b).

PROVISION OF WATER AND SEWAGE SERVICES. Some form of water and sewage service is available to most Colombian residents. In 1997, potable water services reached 94.1% of urban areas, and sewage services covered 80.8% of urban areas. Thus, approximately 2 million people lacked water service and 5.5 million people lacked sewage service. The lowest level of water and sewage service was found in department capitals with fewer than 100,000 inhabitants. In such areas, water supply coverage averaged 70.6%, and sewage coverage averaged 44.8% (*Contraloría* 2002b).

However, wastewater treatment is in general inadequate, and therefore water quality is typically not fit for human consumption. As a result, 60% of the Colombian population is at medium to high risk of contracting illnesses from poor water quality. Of Colombia's 1,709 water service entities, 35% had no wastewater treatment plant. Furthermore, the majority of the wastewater treatment plants in urban zones have serious operational deficiencies. Although wastewater treatment plant construction has grown significantly in recent years, the situation is still alarming – only 8% of the urban population had wastewater treatment coverage in 1998 (*Contraloría* 2002b).

SOLID WASTE. The *Contraloría* (2002b) argues that solid waste collection has lacked appropriate technical systems operations. For example, monthly solid waste production in Bogotá, Cali, Medellín, and Barranquilla is estimated at 88,076 tons, of which only

69% is collected; the remaining 31% is disposed of informally in the urban area or is released into water bodies.

5.2. Environmental information systems

5.2.1. Background

Law 99 assigned MMA the task of establishing an Environmental Information System (*Sistema de Información Ambiental, SIA*). SIA has at least two functions. One is to provide governmental entities in SINA with the information they need for effective environmental management. The other is to inform Colombians about the state of their environment and thus to facilitate public participation in environmental management. Decrees issued in 1994 charged IDEAM with directing, coordinating, and operating SIA. However, the 2003 decree that created the new MAVDT assigned coordination of SIA to the ministry's General Bureau of Regional Information, Planning and Coordination. According to the *Contraloría* (2003b, 75), the administrative structure of the system lacks clarity.

5.2.2. Efforts to establish a system of environmental indicators

There is wide agreement in Colombia that indicators are indispensable for the formulation of new policies and for overall environmental management. Unfortunately, this agreement is matched by a recognition that regulatory authorities have yet to develop an adequate system of such indicators (Interinstitutional Committee on Indicators 2002; *Contraloría* 2003b).

Efforts to develop environmental indicators have arisen separately at the national and regional levels, and in public and private arenas. Unfortunately, these successive efforts have been more or less independent and uncoordinated, a strong indication that management of these efforts has been inadequate. The first concerted national effort to construct a system of indicators was led by DNP. In 1996, it proposed the Environmental Management and Planning Indicators System, which included 256 indicators.¹² Partly because of the large number and complexity of the proposed indicators, development of this system was eventually abandoned (*Contraloría* 2003b).

In 2001, MMA, with technical assistance from the Economic Commission for Latin America and the Caribbean (*Comisión Económica para América Latina y el Caribe*), undertook a new effort to create environmental sustainability indicators, in coordination with national and regional entities and various research institutes. As a result, in July 2002, these groups published a document describing 32 indicators.

¹² Detailed methodological standards were developed for only 177 of these indicators.

At about the same time, IDEAM and the Ministry of Environment were working with research institutes to develop an environmental baseline. This effort resulted in the publication of the country's first environmental baseline, which included 149 indicators. Unfortunately, however, according to the *Contraloría* (2003b), this effort had a number of weaknesses. The contributions of the participating institutes were not well integrated, and the baseline indicators lacked a unified conceptual framework. The information from the diverse entities utilized different scales, coverage, and data collection methodologies, which made the integration of data difficult (Peña Villamil 2003). Some participants complained that IDEAM—the agency charged with coordinating the effort—did not actively manage the process. Furthermore, resources have not been assigned to maintain the information flow and purchase the technology needed to continue collecting information for this program.

Efforts are currently underway to develop indicators at the level of CARs. According to Decree 1300 of 2002, CARs must establish—in concert with MAVDT—basic indicators for monitoring and evaluating natural resources and the environment. Some CARs have made proposals to develop baselines in their areas, through the formulation of state and pressure indicators. Thus far, however, most CARs have not developed such systems.

As to evaluation of management, the majority of CARs either use the ministry's indicators or have developed their own. Most of the management performance indicators that CARs currently use reflect administrative processes, such as expenditures on reforestation, rather than environmental impacts, such as actual deforestation rates. Unfortunately, the data and models designed by IDEAM are not applicable for the CARs (*Contraloría* 2003b).

MAVDT plans to eventually develop three national indicator systems: (i) environmental sustainability indicators associated with the state of the environment and natural resources; (ii) environmental management indicators, related to the impact of intervention by environmental management authorities; and (iii) sustainable development indicators, which allow comparison in the international arena.

5.2.3. Faltering data collection infrastructure

Overall, although Colombia has made efforts to develop environmental indicators, the country is far from possessing an integrated system. This is, in part, a result of inadequate data collection infrastructure, including environmental laboratories, measuring stations, documentation centers, and basic cartography.

Forty percent of the country's CARs have no environmental laboratories or nonfunctional data collection and analysis infrastructure. Many CARs that have

laboratories underfund them and do not operate them effectively. In 2002, less than \$7,000 million pesos (1.4% of the total CAR investment) were assigned to laboratory facilities. The absence and poor quality of basic cartography present another serious challenge. Many CARs lack basic maps of their jurisdictions or have not updated their cartographic information in more than a decade (*Contraloría* 2003b).

Measurement stations are a problem as well. Only 20 CARs have some type of measuring station, and of these stations, 10 have not registered their networks in the National Catalogue of Monitoring Stations, and only 4 routinely send information to IDEAM. Most stations lack the budget necessary for proper maintenance, even though 97% of the stations have been in service for more than 20 years and have significant maintenance backlogs. Of the activities that the measurement stations are required to perform, only a fraction are actually carried out—25% of hydrology measurements and 45% of climatologic measurement (*Contraloría* 2003b).

A recent review of the SIA by the *Contraloría* found that very few data were being collected at the CAR level. What data CARs had were principally on forestry and had been collected under an agreement with the International Organization of Tropical Lumber in the mid-1990s.

5.2.4. Assessment of data collection in Colombia's Environmental Information System.

Overall, the *Contraloría* (2003b) reports that Colombia “does not have a satisfactory environmental information system.” According to the *Contraloría*, seven factors limit the development of SIA. Many of these factors are also highlighted in Peña Villamil's (2003) report on environmental indicators.

1. IDEAM performs analyses at the national scale, whereas CARs perform analyses at the regional or local scale. As a result, the data and models designed by IDEAM are not applicable for the CARs.
2. Limited integration among SINA entities prevents a flow of information. There is no systematic process for data transfer among institutes. Thus, regionally generated information is not generally used to refine IDEAM information.
3. On the whole, CARs have not demonstrated a strong interest in developing environmental information, as reflected in their limited participation in group efforts at environmental information planning meetings.
4. IDEAM's process of developing a system has lacked continuity. For example, although the above-mentioned meetings resulted in various recommendations for adjustment of the Environmental Information System, IDEAM has not yet implemented the proposed changes.

5. IDEAM and CARs often use incompatible computer platforms. IDEAM should develop network applications through free software so that CARs and other public and private users can use these instruments at low cost.
6. SIA lacks methodological standards or protocols for data collection. Likewise, few advances have been made in generating standards that would allow validation of environmental information.
7. Informational planning instruments are not used. MAVDT, IDEAM and the majority of CARs lack plans to integrate information.

Finally, the *Contraloría* argues that in addition to those seven specific problems, lack of regulation – from constitutional precepts to specific information standards – makes it difficult to advance the SIA.

6. Performance of Major SINA Institutions

This section summarizes documentary and interview data on the performance of the major institutions that constitute SINA, and also considers (in the last subsection) the performance of various mechanisms for institutional learning. A caveat concerning the interview data is in order. Given the time and resource constraints associated with this study, the RFF team was able to interview only a sample of 34 stakeholders from 18 institutions (see Appendix A). In addition, interviewees were not randomly selected and not all interviewees were asked the same questions. As a result, the opinions summarized in this section are not necessarily representative.

That said, we believe the interview data are valuable to an understanding of the performance of SINA's major institutions for at least three reasons. First, the interviewees were selected to provide as much credible information as possible. More specifically, interviewees were selected to ensure adequate representation of the SINA institutions; the considerable diversity of opinions about SINA; and the views of stakeholders involved in the creation of SINA as well as those who participated in it at different points in time. Second, in directing the interviews, the RFF research team used its professional judgment developed through experience with similar research.

Third, and perhaps most important, the RFF team used its professional judgment both in summarizing interviewee comments and in drawing conclusions from them. Our interviewees expressed a wide range of views about critical issues. In the interest of transparency, we have summarized most of these views in this section – we have excluded only opinions that clearly contradict reliable documentary evidence or obviously reflect a strong personal bias. However, we recognize that some of the opinions our interviewees expressed reflect more subtle biases and politicking, a problem inherent in this type of interview research. Our strategy for dealing with this issue was to ignore some of the interview data in drawing conclusions. Specifically, we discounted all opinions except those that represented consensus among all the stakeholders interviewed and/or comported with credible documentary evidence.

To protect confidentiality, opinions are not attributed to specific interviewees. For the same reason, all pronouns referring to interviewees are masculine. In situations where an opinion is attributed to a single interviewee, and where that particular interviewee's current position or past experience could clearly impugn his or her objectivity, we have noted the interviewee's relevant position or experience.

Finally, note that although this section is organized by SINA institution, its scope is not confined to discussing the performance of these institutions in isolation from one

another. Rather, a considerable portion of the section concerns the relationships between and among the major SINA institutions.

6.1. Ministry of Environment; Ministry of Environment, Housing and Territorial Development

6.1.1. Administrative history

We begin with a very brief overview of relevant administrative history. Since 1993, four men have served as president of the country (Table 6): Cesar Gaviria (1990–1994); Ernesto Samper (1994–1998), Andrés Pastrana (1998–2002), and Alvaro Uribe (2002–present). Eight people have served as minister of Environment: Manuel Rodríguez Becerra (1993–1994), Cecilia López Montaña (1994–1995), José Vicente Mogollón Vélez (1996–1997), Eduardo Verano de la Rosa (1997–1998), Juan Mayr Maldonado (1998–2002), Cecilia Rodríguez González-Rubio (2002–2003), and Sandra Suarez Pérez (2003–present). Ministry of Environment policymaking is not dictated by the office of the president: the ministers have considerable independence. However, the president can clearly have a significant influence in the environmental sector. The executive branch can exert its authority by, among other things, appointing the minister, writing the National Development Plan, and exercising its power to remove top staff.

Table 6. Colombia's ministers of environment, 1993–present

Years	President	Minister of Environment
1990–1993	Cesar Gaviria Trujillo	N/A
1993–1994		Manuel Rodríguez Becerra
1994–1995	Ernesto Samper	Cecilia López Montaña
1996–1997	Pizano	José Vicente Mogollón Vélez
1997–1998		Eduardo Verano de la Rosa
1998–2002	Andrés Pastrana Arango	Juan Mayr Maldonado
2002–2003	Alvaro Uribe Velez	Cecilia Rodríguez González-Rubio
2003–2004		Sandra Suarez Pérez

Not surprisingly then, the focus of the ministry has varied under different administrations. The Samper administration (1994–1998) represented a period of institution building and capacity building following the passage of Law 99 in 1993. Largely financed by the World Bank and the InterAmerican Development Bank, this effort proved fairly successful, even though the Samper presidency was marked by violence, scandal, and political turmoil (Latin American Database et al. 1996). According to one interviewee, the success of this effort was due in part to its popularity at the local level, particularly among mayors.

Under the Pastrana administration (1998–2002), the ministry's focus shifted from building institutional capacity at the national level to building participation at the project and community level. These efforts primarily focused on rural environmental issues, such as forestry and land use. A major achievement from this period was strengthening Colombia's National Parks System. National legislation was passed to underpin the system, and local communities were recruited to help build it in selected locations (Ministry of Environment 2002).

All our interviewees agreed that the Uribe administration has focused most of its resources and political capital on the peace process and by comparison has devoted relatively little attention to the environment. One interviewee – one of the architects of Law 99 – stated that the broad foci of the ministry under the Uribe administration (2002–present) have been shrinking the size of the national bureaucracy and reforming the system of CARs to reduce perceived corruption and inefficiency.

6.1.2. Limited environmental management capacity

PREVIOUS EVALUATIONS. Previous evaluations of SINA have found that environmental management capacity at the Ministry of Environment is inadequate, in part because of low levels of human capital. For example, Booz-Allen & Hamilton (1997, 20) found that the ministry requires better-trained and more technically qualified civil servants. The *Contraloría* (2003a) found that, aside from a lack of human capital, the ministry lacks procedures and documentation for clearly defining the activities of its staff.

THE CURRENT SITUATION. In 2002, prior to the merger of the Environment and Economic Development ministries (discussed below), the Ministry of Environment's staff comprised 290 persons. Table 7 presents their composition and average salaries. An analysis of the extent to which this staff and these salaries are sufficient and appropriate is beyond the scope of this study.

Table 7. Ministry of Environment staffing and annual salaries, 2002

Position	Educational requirement	No.	Average salary (pesos)
Director	College degree; graduate degree or 2 years' work experience	11	58,741,902
Advisor	College degree; graduate degree or 2 years' work experience	48	42,080,013
Professionals	College degree	120	19,937,296
Technical/administrative	High school	33	11,722,495
Administrative		78	8,902,171
TOTAL		290	21,171,340

(Source: MAVDT 2004)

Prominent members of the environmental community in Colombia have been highly critical of the Ministry of Environment under Uribe (e.g., Santamaría 2003). Of particular concern has been a perceived decline in human capacity. Several stakeholders interviewed for this report echoed these critiques. They stated that human capacity at the Ministry of Environment is particularly low because of cuts in staffing and hiring for political reasons. According to one interviewee – an architect of Law 99 – the ministry is now at its lowest point in terms of effectiveness and technical capacity since its creation and even compares unfavorably with INDERENA, the institution affiliated with the Ministry of Agriculture that preceded it. He attributed the present state of the ministry to systematic removal and/or replacement of qualified staff. For example, he said that whereas former Ministers Eduardo Verano de la Rosa and Juan Mayr Maldonado each had 10 to 20 technical support staff to aid them, Juan Pablo Bonilla, the current vice-minister of Environment in MAVDT, has only 4 or 5 persons to do the same work.

6.1.3. Inadequate coordination with regional environmental authorities

As discussed in Section 3.4, the decentralized design of Law 99 creates tension between the Ministry of Environment and CARs. Law 99 gave CARs a great deal of administrative and fiscal autonomy. But it also gave the Ministry of Environment the role of leading SINA and, in particular, of overseeing and coordinating the activities of CARs. Unfortunately, a variety of evidence suggests that the ministry has underperformed in this area. Of the documents reviewed for this report, Booz-Allen & Hamilton's 1997 evaluation of SINA presents what may be the most frankly critical assessment:

Currently, each component of the system conceived of in Law 99 of 1993 is working in an independent and divergent manner – each executes its own Action Plan based on its subjective interpretation of the National Environmental Plan, adapting it according to its own regional needs... The problem arises principally from the absence of leadership on the part of the central axis of the system, in particular, a failure to coordinate actions, assign work, process information, and evaluate results in accordance with national intentions...[this failure] results in duplication of efforts and an increase in operational costs. (4)

...with the lack of a system leader, [each CAR] interprets its function as an individual entity, and not ... as part of the system. (5)

Management of relations between MMA and CARs, territorial entities, research institutes and urban environmental authorities [is] dispersed. This dispersion generates, on the one hand, inconsistency in decisions on environmental matters, and, on the other hand, ambiguous and contradictory administrative action, and what's worse, the absence of a unique sectoral policy. (18)

Other major evaluations of SINA generally concur that coordination between the Ministry of Environment and CARs is weak. For example, Galán (1998, 12) finds that “erratic relations” between them have significantly impaired the operation of SINA. He recommends increased integration of CARs into the planning and policy formulation carried out by the ministry.

In general, the interviews conducted for this study echoed previous studies’ findings that the Ministry of Environment is not able to exert sufficient control over the planning and functioning of CARs.

As discussed in Sections 3.2.2–3.2.5 and 3.3.3, national authorities have a variety of mechanisms at their disposal to ensure that CARs act in accordance with national policies. First, CARs are required to submit 10-year, 3-year, and 1-year action plans that tie in with the National Development Plans drafted by the executive branch. The *Contraloría* can set in motion procedures to remove CAR directors general from office for failure to comply with these requirements or failure to carry out their plans. In addition, CARs can be sued in court for developing plans that do not comport with the National Development Plan. Second, the National Department of Planning must approve CAR investment projects. Third, CARs’ boards of directors include a representative of the Ministry of Environment, as well as a representative of the president of Colombia. Fourth, Colombia’s control organizations can discipline CARs

for failure to implement plans or for abuse of office. Fifth, national authorities have some control over the salaries of CAR staff. Finally, in the past, the Ministry of Environment and other national institutions have contributed investment funds – or have allocated funds contributed by multilateral institutions – and this power of the purse has given them some sway over CAR investment projects. As discussed in the Appendix, other countries with decentralized environmental management systems have relied heavily on co-financing to coordinate activities at the national and regional levels.

Several factors limit the effectiveness of these mechanisms. First, as discussed in Section 5, the ministry has very poor information about the investment, policy implementation, and regulatory enforcement activities of CARs. The performance indicators CARs currently use typically reflect regulatory processes rather than impacts. For example, CARs often report on the amounts of money spent rather than how these investments affect environmental quality. The ministry's information about environmental quality at the regional level is also quite poor. Effective coordination is simply not possible without such basic information. Second, as discussed in Section 6.7, levels of staffing in the national office of the Delegate *Procuraduría* for Environmental Affairs are inadequate to monitor or evaluate the performance of CARs, and the *Contaloría* is severely hampered by lack of data. As for regulations that mandate intensive planning at the regional level, as discussed in Section 3.3.3, previous evaluations have concluded that even when CARs do fulfill their planning requirements, they often follow only the letter of the law, rather than actually orient resource management. New planning requirements established in 2001 may mitigate this problem somewhat. Finally, as discussed in Section 4, the current fiscal situation and a decline in multilateral funding constrain the MAVDT's ability to co-finance investment.

National authorities have two major environmental funds at their disposal to facilitate co-financing – FONAM and the National Royalty Fund established under the 1991 Constitution. However, as discussed in detail in Section 4.3, various characteristics of each fund reduce their effectiveness as a mechanisms for coordinating national and regional environmental policy: each fund alone probably has insufficient resources to have the desired impact; several of the funds have goals other than coordinating national-regional environmental management and/or entail legal restrictions that would limit the Ministry of Environment's discretion in deciding how and where to disburse funds; some of the funds have been plagued by poor management; and some have limited resources outside of national appropriations.

6.1.4. Merger of the Environment and Economic Development ministries to create MAVDT

The merger of the Environment and Economic Development ministries in 2003 is one manifestation of the Uribe's administration's campaign to shrink the size of the national

bureaucracy.¹³ It is clearly too early to gauge the overall impact the merger. It will depend partly on the capabilities and predilections of the senior management appointments in the new combined ministry. However, the merger is likely to have both advantages and disadvantages.

DISADVANTAGES. Several high-profile members of the environmental community have voiced negative views on the merger. For example, in a 2003 *El Tiempo* article, former Minister of Environment Juan Mayr argued, "A minister that has the environmental banner goes and defends [the environment] in the Council of Ministers, in CONPES, and in Congress. This isn't the case with a vice-minister.... Colombians should expect deterioration of the environment and of their quality of life." Likewise, former Vice-Minister Ernesto Guhl Nanetti wrote, "This decision [to merge the ministries] was a tremendous error...(Santamaría 2003)."

Most of the stakeholders interviewed for this report focused on the potential disadvantages of the merger, not the advantages. First, echoing Juan Mayer's comments in *El Tiempo*, most interviewees noted that the merger lowers the profile – and potentially the influence – of the Ministry of Environment. Several interviewees pointed out that in effect, Colombia no longer has an Environment minister – only a vice-minister. Thus, in the national bureaucracy, the Ministry of Environment has essentially been "demoted." Moreover, three interviewees pointed out that some issues formerly handled by the Ministry of Economic Development – for example, providing housing and infrastructure for potable water for the poor – are more popular among the electorate than environmental issues and are generally considered more urgent as well. As one interviewee put it, Economic Development addresses "short-term" problems, while Environment addresses "medium- and long-term" problems. As a result, environmental issues are likely to get shunted aside under the new system.

Second, several interviewees mentioned that the merger of the Environment and Economic Development ministries is likely to create conflicts of interest because MAVDT will be responsible both for investing in infrastructure and for ensuring that the environmental impacts from these investments are minimized. In effect, the merger of the ministries has the potential to create the same conflicts of interest between providing infrastructure and licensing it that the Uribe administration has identified as a major problem in CARs.

¹³ Uribe's election platform included a plan to merge the Environment and Agriculture ministries. However, this plan was ultimately changed. According to an interviewee who lobbied for this change, it stemmed from the belief that merging the Environment and Economic Development ministries could help improve administration of infrastructure investments (primarily in sanitation and water). Authority for such investments had historically been split between Environment and Economic Development.

ADVANTAGES. The merger of the ministries may generate a number of benefits. First, it may facilitate better administrative coordination of investments in infrastructure, particularly for water supply and sanitation. Historically, such coordination has been lacking. More specifically, large investments in water – and to a lesser degree sanitation – often require environmental impact assessments and permits from authorities at the national level. As discussed below, these requirements have involved notorious red tape and delays. Some of our interviewees thought that the merger might mitigate this problem.

Second, the merger may help in efforts to integrate or “mainstream” environmental concerns into planning and decisionmaking in both the infrastructure and the housing sectors. For example, some interviewees mentioned that it may help make land-use planning an integral component of decisions on housing projects.

Third, the merger might help correct long-standing biases at MMA, specifically (i) a tendency to focus on the benefits of environmental regulation but ignore the costs; and (ii) a tendency (discussed in more detail below) to emphasize rural environmental issues at the expense of urban issues. Because MAVDT will be responsible for promoting economic development as well as environmental regulation, some of our interviewees believed it would be more likely to be aware of trade-offs between the benefits and costs of regulation. Similarly, the fact that MAVDT will be involved in housing and infrastructure investments in urban areas may force it to focus more on urban environmental issues.

6.1.5. Green bias

Considerable evidence suggests that MAVDT, like MMA before it, has a “green bias” That is, even though more than 70% of the Colombia’s population lives in urban areas, it focuses on natural resource and rural environmental issues, such as forestry and biodiversity, and tends to pay insufficient attention to urban environmental issues, such as air quality, water quality, and solid and hazardous waste management.¹⁴ This bias is evident from MMA investment (versus operational) spending from 2002 (Table 8). Green issues accounted for three-quarters of the ministry’s investment budget. According to one MAVDT manager, prior to the merger of the Environment and Economic Development ministries, only about 10% of MMA’s staff worked on “brown” issues.

¹⁴ The adjective “green” is used in environmental policy to refer to natural resource issues such as forest and biodiversity conservation; “brown” is used to refer to urban environmental degradation issues such air pollution, water pollution, and hazardous and solid waste. A more complete discussion of this dichotomy as it relates to SINA is contained in Blackman et al. (2003).

Table 8. Ministry of Environment, Housing and Territorial Development investment budget by issue, 2002 (millions of Colombian pesos)

Issue	Pesos	%
"Green"		
Strategic ecoregions	357,300	1
Forests	15,299,700	59
Biodiversity	3,652,000	14
Green markets	368,100	1
"Brown"		
Urban quality of life	227,000	1
Endogenous prdn. processes	371,500	1
Cleaner production	4,941,600	19
"Green and brown"		
Water	644,200	2
TOTAL	25,861,400	100

(Source: *Contraloría* 2003a)

According to our interviewees, the Ministry of Environment's green bias is rooted in its history. When INDERENA, Colombia's first national environmental authority, was founded, the population of Colombia was predominantly rural. Also, INDERENA was a semiautonomous branch of the Ministry of Agriculture. Historically, the bulk of the staff of both INDERENA and MMA has been made up of biologists, forestry engineers, and ecologists concerned with green issues.

6.1.6. Regulatory capture and corruption

Regulatory capture and corruption appear to be significant problems in environmental regulatory institutions at both the national and the regional levels. We use these terms to refer to situations where interest groups exert undue influence on the activities of environmental authorities, so that instead of acting to further social welfare, the authorities act to further the interests of select groups. Corruption involves violation of laws—for example, bribery and intimidation—but regulatory capture does not.

Numerous studies have documented high levels of regulatory capture and corruption in the Colombian government. Saez (2003, 933), who bases his report on a national survey of public- and private-sector stakeholders, concludes, "...the incidence of capture of legislative, executive and regional authorities in Colombia is higher than any other country in the region." The survey results that Saez uses to support this conclusion include the following: 70% of private company respondents said that bribes are "very common" at Colombian regulatory agencies (935); approximately 30% of public employee respondents said that the purchase of public posts is a frequent practice; and on average, public employee respondents said that 50% of Colombian

government contracts involve a bribe (940). Saez identifies three factors that contribute to state capture in Colombia: virtually unregulated private-sector financing of political campaigns; the influence of the drug trade on legislative decisionmaking; and “clientelism” – the practice of obtaining votes through promises of government posts (936). Seligson (2001) reaches similar conclusions. Relying on a telephone survey of 2,400 residents of Colombia’s major cities, he found that 70% of survey respondents believe that corruption is “common” or “very common” in Colombia.

Our own interviews suggest that, as in the rest of Colombia’s public sector, regulatory capture and corruption are significant problems within SINA. At the national level, private-sector interests have disproportionate influence on environmental policymaking. As discussed in Section 6.9, our interviewees agreed that national NGOs are relatively weak and have few meaningful formal or informal avenues for participation.

The opposite is true of private-sector interest groups, however. Private industry appears to have considerable access to formal and informal avenues for participation. For example, as discussed below, private-sector interests dominate the National Technical Advisory Council, a state of affairs that arises from the design of the Council as laid out in Law 99. In addition, since the mid-1990s, MAVDT has promulgated dozens of voluntary agreements with private industry. As discussed in Section 6.1.8, these agreements often serve to perpetuate and legitimize noncompliance by industry.

6.1.7. Inadequate regulations

Although Colombia has extensive environmental regulations, they are inadequate for a number of reasons. First, in many cases, urgently needed regulation simply does not exist. The *Contraloría* has repeatedly documented major gaps in regulation (*Contraloría* 2002a, 2003a). For example, a recent programmatic audit found that MAVDT has not yet established maximum permissible limits of pesticides in foods, formulated economic instruments to motivate reduction in use and management of pesticides, or developed implementing regulations for the *Estatuto Único Forestal* or for the Statute on Use and Classification of Soils, a critical instrument in land-use planning (*Contraloría* 2003a).

Second, some regulations are incomplete and lacking in critical details. For example, the *Contraloría* notes that a lack of regulation regarding the scope and applicability of public hearings has made the use of such hearings virtually incoherent (*Contraloría* 2003a). In addition, a lack of procedural regulation for environmental licensing has likely contributed to the proliferation of voluntary environmental guides (*Contraloría* 2003a). These guides clarify exactly what polluters need to do to obtain a license. The *Contraloría* noted that MAVDT’s failure to issue environmental guides and adopt as

regulation those that have been issued has generated a lack of clarity in enforcement procedures, monitoring, and project evaluation (*Contraloría* 2003a).

Third, some regulations are overly prescriptive and potentially inappropriate to local economic and social circumstances. For example, command-and-control emissions standards sometimes have been adopted from more developed countries with little modification. According to stakeholders interviewed for this report, such standards are simply unrealistic for most firms, which lack the technical information or other resources necessary to adopt and operate the abatement technology.

These inadequacies in Colombia's regulations lead to many problems. They contribute to poor coordination between MAVDT and the CARs by making it difficult for CARs to carry out one of their basic functions – implementing regulations established at the national level. They also make it difficult for other institutions in SINA to perform their assigned roles. For example, the *Contraloría* noted that lack of regulation – from constitutional precepts to specific information standards – makes it difficult to advance the Colombian System of Environmental Information (*Contraloría* 2003b). Incomplete licensing and permitting regulations lead to inconsistent requirements and enforcement across CARs, creating a fertile ground for corruption (see Section 6.2.4). Lack of clarity in laws and regulations also burdens Colombia's judicial system. Some interviewees noted that lack of clarity in Colombian environmental law (both statutes and regulations) has contributed to the proliferation of *acciones de tutela* brought to protect the environment (see Section 6.8).

6.1.8. Voluntary regulation

BACKGROUND. The strategy of developing and promulgating regulatory standards and guidelines that are not strictly mandatory has been a focus of both the Ministry of Environment and some CARs, practically since the passage of Law 99 in 1993. The last three ministers of Environment in particular have emphasized the use of voluntary regulations. Two types of voluntary regulations are popular in Colombia. The first is to negotiate clean-production agreements (*convenios de produccion limpia*) with polluters. The agreements either target specific productive sectors (for example, transportation or agriculture) or specific regions. Typically, they involve a *quid pro quo*: polluters pledge to improve environmental performance over a specified period, and in exchange, the regulator declares a certain grace period during which existing command-and-control standards are not enforced. The ostensible purpose of such agreements is to mitigate the problem of chronic noncompliance in certain sectors and certain regions by “building consensus” among polluters on the need for compliance, and by providing polluters with some guidance on how to achieve compliance. Many clean-production agreements were signed in the mid-1990s. Self-reported data collected by the Association of CARs and AAUs (*Asociación de Corporaciones Autónomas Regionales de Desarrollo Sostenible y*

Autoridades Ambientales de Grandes Centros Urbanos – ASOCARs) indicates that by 2002, CARs had signed a total of 101 clean-production agreements with various sectors (ASOCARs 2002).

Environmental guides (*guias ambientales*), a second type of voluntary regulation, are also popular in Colombia. These are manuals that detail options for improving environmental performance in specific sectors. They typically focus on pollution prevention rather than end-of-pipe abatement strategies. Environmental guides have their origin in the national Cleaner Production Policy, a policy paper issued by the National Environmental Council. Fifty-seven environmental guides have been published covering approximately 60% of all productive sectors. The guides have been written for sectors where licensing is mandatory, and also for sectors where licensing is not required, such as livestock production. Clean-production agreements and environmental guides have both strengths and weaknesses.

STRENGTHS. As noted above, the purported strength of clean-production agreements is to build consensus for improved environmental performance in sectors or regions where compliance is a chronic problem. According to one interviewee formerly affiliated with DAMA, the Bogotá Urban Environmental Authority, clean-production agreements can have an impact, at least at the regional level. This interviewee maintained that several clean-production agreements negotiated and administered by DAMA have been successful.¹⁵ The interviewee who described these success stories took pains to emphasize, however, that in his view, voluntary agreements will work only in sectors and regions where environmental regulatory institutions are strong, and only as a complement to conventional command-and-control regulation.

One of the architects of Colombia's environmental guides argued that these manuals have a number of strengths. First, industrial sectors have input into the guides, and therefore they build consensus for improved environmental performance. Second, they fill a significant gap in Colombian regulation—a lack of technical guidance on how emissions standards are to be met. Such gaps imply that emissions standards are unrealistic for most firms, which lack the technical information (or other types of resources) needed to purchase and operate abatement devices or adopt clean technologies.

Third, environmental guides clarify exactly what polluters need to do to obtain a license and therefore facilitate consistent and transparent licensing. As discussed below,

¹⁵ One such program focused on small and medium enterprises in Bogotá. A second successful voluntary program called *Programa Excelencia* is not a conventional clean-production agreement. It involves rating the environmental performance of polluting facilities and then publicizing these ratings.

licensing requirements and processes differ markedly across CARs, and *ad hoc* and corrupt licensing is a major concern for many firms and farms. According to this interviewee, in sectors where licensing is required, the environmental guidelines constitute *de facto* binding (*vinculantes*) regulations, and efforts are underway to give the guidelines the legal status of regulation – that is, to make them *de jure* binding.

Fourth, by improving polluters' technical capacity and establishing uniform standards, environmental guides reduce the transaction costs of permitting for firms, CARs, and MMA. Fifth, in sectors where permits are *not* required, the guides may help firms improve their environmental performance by lowering the informational costs of pollution prevention and pollution abatement investments. Finally, environmental guides may help firms meet growing demands for cleaner production in the international marketplace. According to this interviewee, several sectors require some type of certification that firms are producing in an environmentally friendly manner. The environmental guides facilitate this certification.

WEAKNESSES. Notwithstanding these potential benefits, both interview and documentary data suggest that clean-production agreements typically have not succeeded in improving environmental performance. During the grace period specified in the agreement – that is, the period during which polluters have committed to investing in pollution control and prevention and during which regulators have promised not to enforce regulations – polluters do not actually make any significant new investments. In any case, regulators typically have no means of assessing environmental performance because the clean-production agreements do not include indicators or establish a baseline. Thus, the agreements simply end up legitimizing inaction on the part of both polluters and regulators. Evidently, this has been the pattern for most national-level sectoral clean-production agreements. One interviewee noted that voluntary agreements are very attractive politically, perhaps for this reason. According to this same interviewee, as noted above, clean-production agreements work only as a complement to strong command-and-control regulation, and only in sectors and regions where regulatory institutions are strong.

Esterling Lara (2003) evaluated a sample of 13 voluntary clean-production agreements including both single-sector and multisector agreements as well as agreements at the national level and at the regional level. Esterling Lara's findings are decidedly mixed. He found that many of the agreements suffered from weaknesses that rendered them ineffective. For example, commitments made by the signatories to the agreements – and moreover, the consequences of failing to keep these commitments – were typically vague and ill defined. In addition, the agreements did not identify sources of financing for costly pollution abatement and prevention investments. Finally, the legal status of the agreements was unclear. These conditions created incentives for stakeholders to sign these agreements even if they had no real intention of meeting their commitments.

Esterling Lara developed a system to rank the extent to which signatories complied with various components of the voluntary clean-production agreements in his sample. In general, these rankings were quite low. For example, in evaluating a voluntary clean-production agreement by the national coal sector, Esterling Lara assigned rankings of “zero” (on a scale of zero to 100) to all of the components of the agreement that concerned “incentives and financial resources” and “followup and evaluation.” Similarly, in evaluating electricity sector agreements, Esterling Lara assigned rankings of “zero” to eight of the nine components of the agreement on “clean-production promotions strategies,” three of the four sections on “legal and technical environmental norms,” and three of the five sections on “incentives and financial resources.”

Our interviewees identified two weaknesses in Colombia's 57 environmental guides. First, they are being used for a purpose other than that originally envisioned, and as a result they do not serve that function very well. The guides were originally conceived as a way of implementing the national Cleaner Production Policy. Specifically, they were to enable facilities to move beyond compliance with existing command-and-control regulations by adopting clean (pollution-prevention) technologies. However, as discussed above, in sectors where licenses are required, they have evolved into guides for achieving compliance with existing regulations. Unfortunately, the guides do not serve this end very well. There is often no clear link between existing command-and-control regulations and the information in the environmental guides. Hence, there is no guarantee that a firm that follows the advice provided in the guide will actually meet existing regulatory standards.

Second, the environmental guides typically provide a limited range of technological alternatives for pollution prevention and pollution control. These alternatives are not always the most appropriate for all scales and types of firms in the sector. For example, they may be appropriate for large firms, but not for the small and midsize firms that may constitute the bulk of firms in the sector.

6.1.9. Effluent fees for wastewater

As discussed in Section 3, Law 99 provides the legal underpinnings for several types of economic incentive instruments, including effluent fees (*tasas retributivas*), water use fees, and natural resource fees (*tasas compensatorias*). Of these instruments, effluent fees for wastewater have generated the most controversy.

According to a study of the impact of effluent fees undertaken by the Ministry of Environment and summarized by Gómez Torres (2003), when implemented adequately, such fees have been quite effective. In those jurisdictions where implementation has been complete, BOD loads fell 27% between 1998 and 2002, and TSS loads fell 45%,

However, just nine jurisdictions have implemented effluent fees adequately. In other jurisdictions, impacts have been significantly smaller (Gómez Torres 2003, 39).

Overall, the performance of effluent fees for wastewater has not matched the expectations of those who drafted Law 99. One interviewee said that, in part, this was because the framers of Law 99 held unrealistically high expectations for the effectiveness of this instrument. Their view – strongly influenced by the environmental economics literature on instrument choice – was that economic incentive instruments were more efficient than poorly performing command-and-control regulations and therefore were likely to be more effective than these “first generation” instruments. However, the policymakers failed to appreciate that like command-and-control instruments, economic incentives instruments are ineffective absent strong environmental regulatory institutions and stringent enforcement.

Colombia's effluent fees for wastewater face several challenges. First, in most cases CARs simply do not enforce fee programs. Only a few high-functioning CARs actually collect a significant percentage of effluent fees. Self-reported 2002 data collected by ASOCARs indicates that for all 32 CARs, of the 45,625 “potential” sources that could be charged effluent fees, only 5,356 (11.7%) are actually charged. Gómez Torres (2003) reports that of the effluent fees that CARs charge to polluters, only one-third are actually collected (40). Evidently, most CARs lack the capacity or political will (or both) to collect the fees.

Second, even where effluent fees are collected, they do not always create significant incentives for abatement. Among the sources of water pollution covered in the effluent fee program, municipal sewage is likely to be quite important. Interviewees said that the authorities typically do not have the financial wherewithal to build wastewater treatment facilities. As a result, they try to pass effluent fees on to their customers by charging higher fees for the provision of water and sewage services.¹⁶

According to several interviewees, a third important problem with effluent fees is that they represent a misallocation of resources. Investments in the provision of potable water are much more urgently needed than investments in wastewater treatment. Therefore, the revenues raised by the fees, and the institutional resources spent enforcing them, should be reallocated to investment in the provision of potable water.

¹⁶ Several interviewees from a private-sector trade association noted that the problem of “exorbitant” effluent fees was mitigated to some extent by Decree 3100 of 2003, which modified the way the fees are calculated. Originally, the fees could be increased by as much as half a percentage point every six months if local surface water did not meet certain ambient standards, regardless of the quality of the effluents that individual facilities were discharging. The 2003 decree modifies this procedure, in effect adjusting water fees downward.

Finally, effluent fees focus on too limited a set of pollutants. The fees are calculated based on quantities of TSS and BOD in waste streams. They do not cover, and therefore do not create incentives to control, other pollutants, such as heavy metals and fecal coliform bacteria.

6.1.10. Licensing and permitting

Both MAVDT and CARs are responsible for licensing and permitting, depending on the sector and scale of the facility. Since licensing and permitting is performed by CARs, we reserve this discussion for Section 6.2.3 below.

6.2. CARs and AAUs

6.2.1. Corruption and regulatory capture

As discussed above, numerous studies have concluded that corruption is a serious problem in Colombia. These same studies find that corruption is a particular problem at *regional* levels of government (Saez 2003; Transparency for Colombia Corporation 2001). For example, Transparency for Colombia Corporation (2001) finds that just as governance has been decentralized, so too has administrative corruption. For obvious reasons, hard evidence of corruption (and regulatory capture) in CARs is difficult to come by. Among our interviewees, however, only a few considered CARs rife with outright corruption, defined as illegal activity, such as bribery.

Evidence suggests that regulatory capture is a serious issue in CARs. Using a *Contraloría General* methodology to evaluate internal control systems, Vargas (2003, 58) classifies the majority of CARs as at “medium” or “high” risk of corruption and concludes that their processes and procedures represent failures in compliance with legal and oversight requirements.”

Because corruption and regulatory capture are covert by nature, hard evidence of these activities is scarce. However (notwithstanding their views on outright corruption), most of our interviewees considered regulatory capture a widespread problem in CARs. In other words, most believed that the functioning of CARs is unduly influenced by local interest groups. Most important, at least eight interviewees argued that political concerns play too strong a role in CARs’ sanitation and other environmental investment decisions – a significant problem, since the vast majority of such investments in Colombia are made by CARs. For example, reforestation and wastewater treatment projects are sometimes spatially targeted to maximize political payoffs instead of ecological benefits.

Aside from the allocation of investment funds, permitting and licensing are additional CARs functions subject to regulatory capture, in the view of our interviewees. Many interviewees believed that a significant share of the representatives of nongovernmental organizations on CAR boards of directors are phony – that is, the NGOs they purport to represent are shell organizations that front for industrial or political interests. Finally, interviewees mentioned that regulatory capture is a particularly worrisome problem in AAUs because of their relative lack of autonomy from municipal authorities. Unlike CARs, AAUs are not able to generate most of their funding internally. Rather, they depend on municipal revenues. Also, AAU directors are appointed by the mayors of the cities within which they operate.

Although most of the stakeholders interviewed for this report agreed that regulatory capture, if not corruption, is a serious issue in CARs, not all did. Several interviewees stated that reports of corruption and regulatory capture in CARs are overblown. One interviewee said that in his experience as a delegate of MMA on the board of directors of a southern CAR, he saw little evidence of corruption or regulatory capture. A second interviewee stated that corruption is a systemic problem in Colombia, and CARs are no more or less corrupt than other Colombian institutions. Although outright corruption exists in some CARs, he said, it is not a problem in most. Regarding regulatory capture, this interviewee said that mayors on CAR boards of directors represent legitimate political interests, and it is unfair to characterize them as unduly beholden to private interests. The fact that they attempt to funnel investments to their constituents is to be expected. Furthermore, mayors have incentives to promote environmental protection because their constituents presumably value environmental protection as well as economic development. In any case, they do not have the power to redirect investments in such a way to benefit their constituents at the expense of others. In this interviewee's view, accusations of corruption are a political ploy designed to consolidate political power at the national level.

Notwithstanding differences of opinion among our interviewees regarding the seriousness of regulatory capture and corruption within SINA, the weight of evidence culled from interviews and documents strongly suggests that these are significant problems at the national and regional levels.

6.2.2. Lack of technical and administrative capacity

Considerable evidence demonstrates that environmental management capacity varies markedly across the CARs. Shortages of human and technical capacity are partly to blame. In 2002, total CAR and CDS staff comprised 3,805 persons, an average of 115 persons per CAR or CDS (MAVDT 2004). According to Vargas (2003), on average, only one-third of CARs staff are “professionals” (i.e., have a college education). Moreover, only 8 CARs have staffs with more than 50% professionals, 15 have less than 30%

professionals, and 5 CARs have less than 15% professionals. Booz-Allen & Hamilton (1997, 9) also found a general “scarcity of highly-qualified human resources” in CARs with poor governance. Vargas (2003, 55) sees a direct relationship between overall efficiency of CARs and the proportion of professionals on their staffs. González et al. (2002, 85) cite technical and institutional weaknesses in the CARs as one of the leading problems inhibiting environmental investment projects.

Technical capacity is also generally in short supply and varies markedly. CARs average only 0.43 computers per civil servant (Vargas 2003, 53). As discussed in Section 5, 40% of CARs do not have functional environmental laboratories. More than half of CARs lack any kind of measuring station, and those stations that do perform only a fraction of the required activities.

Shortages of human and technical capacity are not surprising given the highly unequal distribution of financial resources across CARs. As discussed in Section 4, almost three-quarters of the total revenue generated by all 33 of Colombia's CARs accrues to just eight CARs. As is clear from Section 8, numerous past evaluations of SINA have suggested correcting such fiscal imbalances (e.g., Galán 1998; Gómez Torres 2003; Wiesner 1997).

All of this documentary evidence comports with the interview data collected for this report. The consensus opinion of our interviewees was that technical and administrative capacity varies markedly across CARs. Some CARs are excellent; others are dysfunctional. For example, one private-sector interviewee said that in some CARs, utilities cannot find competent CAR staff with whom to negotiate licenses and contracts. In a similar vein, a second interviewee noted that technical assistance in air quality monitoring provided to some CARs is futile because CARs do not have trained personnel capable of using sophisticated monitoring equipment. A third interviewee argued that the main weakness of SINA today is a lack of human resources both in CARs and at the national level.

By most accounts, the variation across CARs in human and technical capacity is highly correlated with regional variation in general governance capacity and levels of economic and social development. That is, CARs with low human and technical capacity are generally located in poor, underdeveloped areas where the rule of law and most types of government institutions are weak.

Several interviewees argued that heterogeneity in regulatory capacity across CARs does not so much represent failure of these institutions as it reflects stark regional differences in all types of capacity in the country as a whole. Put more concretely, some of Colombia's departments – typically, poor rural ones – have relatively few trained professionals or strong government institutions of any type, and it is unrealistic to

expect CARs in these areas to be an exception. Moreover, efforts to create “islands of capacity” in the environmental sector in these areas are unlikely to succeed. Capacity building will simply take time.

6.2.3. Licensing and permitting

By law, MAVDT is responsible for granting environmental licenses and permits to large facilities and those in specified sectors, such as energy generation. CARs are responsible for most other facilities. As a result, CARs grant approximately 70% of all environmental licenses and permits.

Licensing and permitting at the regional level are problematic in a number of ways. First, according to numerous interviewees, both licensing and permitting involve copious red tape and long delays that create bottlenecks in the pipeline for urgently needed investment and economic development. Second, licensing and permitting requirements are not consistent across CARs. For example, in some CARs companies that build roads are required to reforest cleared areas, but in others there is no such requirement. Finally, according to several of our interviewees, licensing and permitting in some CARs are corrupt. For example, CARs directors general sometimes grant licenses to improve their chances of reelection. According to one interviewee, a root cause of all of these problems is that Colombian environmental regulations are often incomplete and unclear (see Section 6.1.7).

6.2.4. Inadequate enforcement

Considerable evidence demonstrates that a wide variety of Colombia's environmental regulations are not consistently enforced. Enforcement varies markedly across CARs, across sectors, and across sizes and types of firms. Contributing factors include a lack of political will and inadequate access to police assistance, as well as several of the problems discussed in Sections 6.1 and 6.2 – regulatory capture, low levels of human and technical capacity, poor information systems, reliance on voluntary regulation, and inadequate regulations.

For example, Sánchez Triana and Medina (1994) state, “In spite of specific norms and permits, including in regions in which government entities have pollution control programs, strict compliance with regulation on the part of industries does not exist ... it is important to underline that even in jurisdictional areas of corporations such as CAR, CVC, and CORNARE], 50% of the industries are not inspected” (258–59). More current evidence comes from Gómez Torres (2003), who reports that of the effluent fees that CARs charge to polluters, only one-third are actually collected. More broadly, the *Contraloría* (2003a) states, “Problems in coordination and communication needed to guarantee firms' compliance with environmental laws, persist in some sectors...[E]nvironmental management problems [degrade] environmental authorities’

ability to enforce established norms.” The *Contraloría* report cites more specific problems that inhibit enforcement. It states that although some regulatory authorities have made advances in sectoral planning, they have made “limited advances in implementation [due to]...deficient mechanisms for follow-up and maintenance ...” (155). Additional factors limiting enforcement include “the limited quantity and reliability of information” (64); a “lack of “indicators to measure concrete results” (154); a lack of “adequate systems for the final disposal of wastes, and limited oversight of compliance with norms” (65); and a lack of “adequate laboratories to verify that the values declared or estimated for billing [of environmental fees] correspond to the real contamination values” (66).

6.2.5. Positive views

Several interviewees espoused three of the fundamental arguments for continued decentralized environmental administration – presumably the same arguments that motivated the decentralization embodied in the 1991 Constitution and in Law 99. First, some interviewees said that autonomy enables CARs to operate independently of local political pressures at the municipality and department levels. Second, several interviewees said that autonomy insulated CARs from bad governance at the national level. Third, two interviewees said that decentralization encourages public participation and social control at the regional level. Finally, several interviewees argued forcefully that given Colombia’s size and diversity, central administration of the environment is simply inefficient or downright impractical. For example, one of these interviewees mentioned that, as a former DNP official in charge of approving CARs’ investments, he had no information with which to evaluate proposals – an illustration of a broader problem faced by national officials trying to make decisions about environmental matters at the CAR level. Two interviewees argued that decentralization is the principal reason that Colombia’s environmental regulatory system functions as well as it does. Prior to decentralization, *de facto* the majority of the country lacked environmental regulation altogether. This remains the situation in Latin America countries where environmental regulation is more centralized.

6.2.6. Reform of CARs governance

BACKGROUND. Alvaro Uribe’s campaign for president included pledges to reform CARs and AAUs. Once elected, Uribe made the reform of CARs and AAUs part of his National Development Plan, and in April 2003, his administration introduced into Congress four reforms to Law 99 designed to mitigate several of the perceived problems with CARs and AAUs.

These proposed reforms must survive four separate debates in Congress to be approved. During the debates, Congress can modify the reforms but MAVDT has only limited authority to do so. MAVDT does, however, reserve the option of withdrawing

the reform altogether. As of mid-February 2004, sources in MAVDT suggest that the reforms are no longer viable – they will not be presented for further debate. The Uribe administration may introduce new reforms but to our knowledge has no concrete plans to do so at this point.

As for the political context of the April 2003 proposed reforms, it is worth noting that, according to one interviewee, they came at a low point in the relationship between the Ministry of Environment and the CARs. Among the national governance institutions, CARs enjoy particularly strong support in the House of Representatives. Unlike senators, members of the House of Representatives are elected by specific regions and tend to have close ties to the CARs in their regions.

CONTENT OF REFORMS. The Uribe administration proposed four reforms of Law 99 in April 2003. The first reform proposed to change the composition and selection of the CAR boards of directors. According to MAVDT, the current composition of the boards facilitates regulatory capture and, as a result, fails to adequately represent civil society. More specifically, the mayors on the boards of directors tend to have strong political ties to the private sector and tend to disproportionately represent wealthy, powerful municipalities. The bill introduced by the Uribe administration proposed replacing two of the four mayors on each board with new representatives – one from the National Parks System, and one from Colombia's university system. In addition, it proposed that mayors be elected at the national level by the National Association of Municipalities instead of by the *Asembleas Corporativas*. The bill also proposed changing the manner in which private-sector representatives are elected. Finally, it proposed better integrating CARs and the five research institutes.

The second reform proposed in April 2003 was aimed at giving AAUs greater autonomy from the municipalities they serve. One of the principal means of doing so was to change the composition of AAU boards of directors. The third proposed reform was to change the way environmental fees established under Law 99 (effluent, compensation, and water use fees) are collected, administered, and allocated. The broad purpose was to ensure greater accountability and transparency. Finally, the fourth proposed reform was to create watershed basin councils (*consejos de cuencas hidrográficas*), which were to assume some of the CARs' management responsibilities.

In addition to those four legislative proposals, the Uribe administration has also been attempting to reform governance in CARs by decree. Among these initiatives was a change in the manner in which CAR directors general are selected. Currently, CAR directors general are elected to three-year terms by CAR boards of directors. There are limited eligibility restrictions for election. The Uribe administration considers this election process problematic because it often results in the selection of directors general who are politically popular but not technically qualified. The Uribe administration

proposes to change the process so that an independent third party – either a private firm or a university – vets nominees and choose a slate of the three most qualified candidates. These candidates will be presented for election.

NEGATIVE VIEWS. Outside interviewees within MMA, virtually all of our interviewees expressed negative opinions of the proposed reforms. Indeed, as MAVDT itself recognizes, there is considerable opposition to the reforms among ex-MMA staff. The negative opinions fell into the following four categories.

First, several interviewees complained that the reforms were rushed to Congress without the requisite study, consultation, and input from appropriate stakeholders. They argued that an objective study of the performance of CAR boards of directors and directors general is needed before reforms can be written. One also argued that the best and brightest policymakers and academics were not involved in writing the reforms, as they were in writing Law 99.

Second, several interviewees commented that the proposed reforms are minor and irrelevant and not likely to have much impact, mainly because they represent a top-down approach to problems that need to be solved by bottom-up participatory efforts. One interviewee called tinkering with institutional design a waste of resources. He argued that the most effective way to improve the functioning of CARs is to increase the participation of civil society and to focus on developing effective projects and programs that change the culture of regulatory agencies. Another interviewee said that increasing the proportion of directors who represent the national government will have a limited impact because very few national bureaucrats understand, and can operate effectively at, the regional level.

Third, several interviewees argued that the proposed CAR reforms are politically motivated. An interviewee who played an important role in designing and implementing Law 99 stated that the underlying agenda of the reforms is to replace CAR directors and directors general with individuals who are more sympathetic to the current administration. A second interviewee argued that the reforms are being pushed by national bureaucrats who regret or oppose decentralization.

Finally, one interviewee said that the reform measures will weaken important checks and balances that arise from the current autonomy of the CARs. More specifically, although this autonomy may somewhat hinder national-regional policy coordination, it prevents abuse, corruption, or bad governance at the national level from having too great an impact at the regional level. Weakening this risk-spreading mechanism is dangerous: even though the current administration may be relatively honest and efficient, future administrations may not be. The same interviewee also thought that reducing social control at the regional level would very likely engender more

corruption, not less. A second interviewee also said it would be a “big mistake” to try to impose more central control on CARs.

POSITIVE VIEWS. Outside interviewees within MMA who are promoting these reforms, only one of our interviewees expressed a positive view of any of them. He said that in his opinion the proposed change to the process for selecting CAR directors general would be a positive step.

ALTERNATIVE PROPOSALS. Several interviewees suggested alternative strategies for improving the functioning of CARs. As noted above, one interviewee suggested putting more power into the hands of civil society and focusing on creating good programs and projects to improve the culture of the regulatory agencies. A second interviewee suggested creating a national environmental fund and having CARs compete for these funds by proposing investment projects. A third interviewee suggested a gradualist approach to environmental decentralization that would entail ranking the regulatory capacity of CARs on a scale of 1 to 4. Autonomy would be granted according to each CAR's ranking. As CARs improved and earned higher rankings, they would be given greater autonomy. Colombia has a similar program for decentralization in the agricultural sector.

6.3. National Environmental Council and National Technical Advisory Council

6.3.1. National Environmental Council

BACKGROUND. As discussed in Section 3, the National Environmental Council (*Consejo Nacional Ambiental*) is a national consultative group attached to MAVDT whose permanent members are drawn from a wide array of institutions, including MAVDT, the Ministry of Education, DNP, universities, the private sector, NGOs, and indigenous and black communities. As envisioned in Law 99, the National Environmental Council's role was to provide a forum for both public-sector and private-sector stakeholders to have a voice in the design of important national environmental policies. It was meant to produce documents that would substantively affect policy. The council does not have a permanent staff or institutional support and meets on an *ad hoc* basis.

PERFORMANCE. The National Environmental Council does not appear to be playing the role described above. Its meetings now attract only about 100 persons. Little meaningful discussion occurs in the council meetings – they are simply a formality. Often, ministers who are supposed to attend send second- or third-tier assistants in their stead.

According to several interviewees, the National Environmental Council has turned into a forum for the dissemination of general policy papers that lack any kind of legal status and have been written by MMA prior to council meetings. Important decisions about

the content of these documents are made behind closed doors, not during the meetings. The council has produced 30-odd policy documents. All have been approved without serious debate and almost all have had little impact.

We would note, however, that contrary to these interviewees' overall view – that the National Environmental Council has minimal impact – a few of its policy documents appear to have triggered real change. These include the National Parks Policy, National Biodiversity Policy, a document on green markets, and the National Cleaner Production Policy.

Despite its obvious weaknesses, several interviewees thought that the council plays a beneficial – if not important – role. Two interviewees said that the council forces MAVDT leaders to interact with various stakeholders, including their counterparts in other ministries. In addition, according to one of these interviewees, who used to be a member of the council, the policy documents the council produces often contain good ideas that are eventually implemented.

6.3.2. National Technical Advisory Council

The National Technical Advisory Council (*Consejo Técnico Asesor*) was created by Law 99 to advise MMA on scientific and technical issues related to environmental policy. Unlike the National Environmental Council, it gives advice on legally binding decrees that establish regulations subject to approval by the president. As discussed in Section 3.2.5, the council is chaired by the vice-minister of Environment and has five to eight permanent members who have considerable technical expertise. These include elected representatives of universities, industry, agriculture, mining, and the petroleum industry. The council does not have a permanent support staff and meets on an *ad hoc* basis.

Although the National Technical Advisory Council includes elected representatives of universities as well as private-sector representatives, stakeholders interviewed for this report agreed that it is dominated by the latter. According to one interviewee who had a hand in designing it, the council has been quite important and effective but recently appears to be withering somewhat. In his opinion, this development is a result of a lack of support and remuneration for council members, who devote considerable time to it, and the frequent inability of the vice-minister to attend meetings, which last three to five days. This interviewee also warned that to function effectively and to avoid regulatory capture, the chair of the council must be technically well qualified. However, appointing a technical expert to lead the council instead of the vice-minister would be risky because the presiding officer needs to have political clout as well as technical expertise.

6.4. National Planning Department

6.4.1. Background

DNP uses three main tools to manage Colombia's investment budget. First, it reviews and approves Colombia's investment budget and evaluates the impacts of this spending. All ministries must submit their budget requests to DNP for approval. Second, it coordinates the writing of the multisectoral National Development Plan (*Plan Nacional de Desarrollo*) that each presidential administration is required to submit. Finally, it serves as technical secretary of the National Council of Economic and Social Policy (*Consejo Nacional de Política Económica y Social*, CONPES). Chaired by the president, CONPES is a high-level, multisectoral governance body that includes ministers and private-sector representatives. It coordinates economic and social policy, approves loans, and issues important policy documents. In addition to these three primary tools, DNP also wields power through a number of lesser mechanisms: it provides technical support to the president on a wide array of matters; it distributes national monies to municipalities; and it has authority to negotiate and approve international loans to all Colombian public-sector institutions.

DNP's internal organization more or less mirrors that of the Colombian national government. That is, DNP has designated offices that deal with each of the various ministries and institutions in the government. Until February 2004, the office dedicated to the environmental sector was the Environmental Policy Office. This office had two primary functions. First, it helped mainstream environmental functions in a wide array of government institutions and practices. To do this, it worked through the budgeting and planning process and through CONPES. Second, it monitored and evaluated the impact of investments in the environmental sector. The Environmental Policy Office was also responsible for coordination between DNP and MAVDT. In February 2004, this office was merged with the Office of Urban Development. The responsibilities and functioning of this new combined office are in flux.

6.4.2. Coordination with MAVDT

Some of the functions of DNP's Environmental Policy Office – for example, planning environmental investment and monitoring its impact – overlap with the functions of MAVDT; that is, the two ministries must conduct these activities jointly. Interviewees at DNP and MAVDT maintain that the relationship between the two agencies is quite harmonious. This is partly because of strong personal ties between top managers at the two institutions. The one area on which there is some conflict between the two institutions is monitoring the impact of environmental investments. Here, MAVDT management tends to consider DNP efforts an intrusion upon its turf. The DNP environmental unit generally has less staff turnover than MAVDT, and therefore DNP provides continuity within environmental institutions at the national level.

6.4.3. Coordination with CARs

According to one DNP interviewee, the principal concern in DNP's relationship with CARs is monitoring CARs' environmental investments and assessing their impacts. DNP's responsibility is to ensure that CARs are spending their funds effectively. However, DNP has considerable difficulty performing this function because, as discussed in Section 5, CARs lack adequate indicators of environmental quality.

6.4.4. Environmental planning in general

Colombian law mandates that governmental institutions at all levels promulgate plans that focus either principally or partly on the environmental sector. As discussed in Section 3.3.4, in light of a 1999 joint DNP-MMA consultation, MMA began a process of strengthening regional environmental planning. The mainstay of this effort is Decree 048 of 2001, which requires CARs to conduct a coordinated planning process in consultation with DNP and provides explicit guidelines on the content of CARs' long-, medium-, and short-term plans. As noted above, CAR directors general can be removed for failure to comply with these requirements. Also, CARs can be sued in court. It is somewhat early to evaluate the success of this reform, but if properly implemented, it could significantly address earlier concerns about lack of coordination between entities within SINA (Booz-Allen & Hamilton 1997).

As useful as that effort may prove to be, it does not address a broader gap in environmental planning. Although the National Development Plan covers the environmental sector (among others), and although plans do exist for environmental subsectors (such as forestry and environmental research), no systematic, periodic planning exercise exists to establish priorities across environmental programs and subsectors, including forestry, air pollution, water resources, and water sanitation.

That gap has been highlighted in past evaluations of planning in SINA (Galán 1998; MMA et al. 2002). Planning is generally done sector by sector, and as yet, efforts to "break out of sectoral boxes" to consider prioritization across programs or sectors have been unsuccessful. Galán (1998) notes that within MMA, efforts had been made to discuss policy documents between subdirectorates, but a, it had not been possible to arrive at shared concepts that would allow discussion of priorities across program areas. Our interviews suggested that this situation has not changed markedly – sector-by-sector planning is still the norm and there appears to be little discussion of priority setting across sectors at a national level in SINA. A review of the most recent National Development Plan confirms that there is little discussion of priorities across environmental sectors (DNP 2003).

A lack of cross-sectoral priority setting is a common problem in environmental regulatory systems around the world (see Appendix B). It arises largely because in most

environmental regulatory systems, day-to-day work is organized by environmental media or problem areas, such as forestry, water, or air.

Lack of cross-sectoral planning permits continued imbalance in budgetary priorities (Galán 1998; *Contraloría* 2003a). Budgetary allocations appear to be driven more by institutional history than by environmental needs. Several of our interviewees noted a “green bias” in policy orientation and budgeting in the Ministry of Environment, which they attribute to its historical roots in INDERENA (see Section 6.1.5). A recent audit of MAVDT found that 59% of the ministry’s budget was devoted to forestry programs but only 1% was devoted to water (*Contraloría* 2003a, 45). Another 1% was devoted to programs on the quality of urban life, even though basic sanitation is one of three major environmental objectives in the 1998–2002 National Development Plan (*Contraloría* 2003a).

6.5. Institutes of investigation

Law 99 recognizes the critical role that information plays in environmental management. The drafters of Law 99 established institutes of investigation to conduct research and collect data needed for public environmental management. Two types of institutes were created by Law 99: those that primarily have research responsibilities (von Humboldt Institute, INVEMAR, SINCHI, and IIAP) and one that primarily has data collection responsibilities (IDEAM).

6.5.1. Lack of coordination with other SINA entities

Contraloría and other reports have repeatedly found that coordination between the institutes of investigation and other SINA entities – particularly MAVDT and IDEAM – is poor (*Contraloría* 2003b). IDEAM’s primary function is organizing and directing environmental data collection in Colombia (Law 99 of 1993, Decrees 1277 and 1600 of 1994). The 2003 annual *Contraloría* report found that the research institutes’ work has not supported this function. One reason for the poor coordination between the institutes of investigation and other SINA entities is that the former tend to specialize in research that is academic and not especially relevant to policymaking. A number of factors contribute to this problem.

First, MAVDT leadership on this issue is not adequate. Under Law 99, the environmental ministry is responsible for articulating SINA research priorities and, therefore, for informing agendas of the institutes of investigation. Yet no provision has been made in recent MAVDT budgets to provide staff time to consider research priorities or communicate those priorities to the institutes or other researchers (*Contraloría* 2003a). According to one interviewee, MAVDT simply does not know what type of research it needs and, partly as a result, does not communicate clear directives to the institutes of investigation. This interviewee said that if MAVDT and other entities

knew what type of research they needed, they could easily contract with the research institutes to conduct it. We discuss the issue of funding and its relation to research in more detail in the next subsection.

Second, some evidence suggests that MAVDT lacks capacity to make use of high-quality, policy-relevant research when it is produced. A government scientist interviewed for this study cited the example of five “red list” books that the von Humboldt Institute prepared on threatened species.¹⁷ MAVDT staff and local environmental authorities need this information to develop land-use plans and issue environmental licenses. However, these books provide so much information that neither MAVDT nor local environmental authorities have the time – or sometimes the background – to use them effectively.

Some interviewees suggested that the disconnect between MAVDT and the research institutes stems from weaknesses in the research institutes as well. According to one interviewee, the researchers do not put enough effort into making their findings “user-friendly.” Whatever its cause, such difficulties suggest that SINA needs to develop a mechanism to translate scientific findings into information that is usable by regulatory staff with varying levels of professional preparation.

Third, several interviewees blamed poor coordination between the research institutes and SINA on weaknesses at IDEAM. According to a MAVDT interviewee who works with IDEAM, this research institute often is not responsive to requests for specific data partly because it lacks resources dedicated to facilitating coordination. A number of interviewees commented that IDEAM places too high a priority on research versus data collection, its principal responsibility.

Fourth, CARs undoubtedly contribute to poor coordination between the research institutes and other SINA entities. CARs have critical responsibilities for collecting environmental monitoring data (*Contraloría* 2003b). Facilities are obligated to self-monitor their discharges, and then report them to CARs. CARs, in turn, are responsible for verifying these data and passing them on to IDEAM. Finally, IDEAM is responsible for certifying that the CARs’ data are accurate and creating a database. Yet IDEAM does not have the human and technical capacity needed to perform these functions (*Contraloría* 2003b). As of late 2003, pilot projects to develop CARs’ technical capacity to collect and transmit data to IDEAM have met with very limited success (*Contraloría* 2003b). As discussed in Section 5, this is undoubtedly in part due to lack of progress on development of a consistent set of environmental indicators. For their part, CARs do not

¹⁷ The red list and red data books are a program of the IUCN (World Conservation Union) designed to list and develop data needed for management to protect threatened and endangered species. See <http://www.redlist.org/info/programme.html>.

see the research institutes as supporting their efforts (*Contraloría* 2003b). Many of our interviewees mentioned that lack of scientific expertise among CAR staff prevents research results from being used.

Fifth, the director of one research institute stated that poor coordination between the researchers at the institutes of investigation and policymakers is partly a result of the different time horizons of each group. Scientific researchers inevitably tend to focus on long-term problems like biodiversity loss. Policymakers, by contrast, tend to focus on short-term issues, the importance of which changes with each administration.

6.5.2. Funding

As noted above in Section 5, national funding for research institutes has declined over the past decade, and as a result, some of the institutes have turned to other sources for financing. As Gómez Torres (2003) points out, this reconfiguration is partly responsible for a disconnect between the research agenda of the institutes of investigation and the needs of MAVDT and other entities in SINA (see Section 8.2). Interview evidence supported this finding. For example, one interviewee, a professional researcher, blamed poor coordination between the institutes of investigation and other SINA entities on a lack of national funding for policy-relevant research. This interviewee noted that Colombia is in the lower quartile of all Latin American countries in terms of funding for environmental research. The situation of the von Humboldt Institute, as described by its director general, illustrates how the funding situation contributes to inadequate coordination between regulators and the research institutes.

The von Humboldt Institute is charged with conducting research on Colombia's flora and fauna and developing a national biodiversity inventory (Law 99 Art. 19). The institute is organized around four themes: (i) biodiversity inventory, (ii) conservation biology, (iii) valuation, and (iv) biodiversity policy and legislation (von Humboldt 2004). Approximately 70% of its 150-person staff are scientists, and the remainder are managers and administrative personnel.

According to von Humboldt's director general, MAVDT contributes 8% of the institute's budget as an outright grant, and another 8% in the form of contracts for specific services. The remainder of the budget is contributed by CARs, NGOs, and international donors, such as the German bilateral foreign aid agency (GTZ) and the Global Environment Fund.¹⁸ To support itself financially, the von Humboldt Institute must pursue topics deemed important by international funders. As a result, even

¹⁸ Von Humboldt has 27 permanent staff whose salaries are paid for by the national government contributions; salaries for the researchers and all other project-specific staff are covered by other sources (von Humboldt 2004).

though the institute's board of directors consists of representatives of almost all the major SINA institutions, the research topics it pursues are not necessarily of central interest to policymakers in SINA. Although the von Humboldt Institute has been the most financially successful of Colombia's research institutes, it still finds generating sufficient funds quite difficult.¹⁹

Self-financing of the institutes of investigation can affect coordination in more subtle ways. For example, unlike the four research institutes, IDEAM depends largely on public-sector financing (*Contraloría* 2002b). Recent national fiscal constraints have led to requirements that IDEAM charge for the data it collects. This may limit the ability of IDEAM to influence the direction of nongovernmental research in SINA. Two academic interviewees commented that this cost recovery policy is problematic because IDEAM data have become too expensive for many researchers to use.

6.5.3. Coverage and configuration

Colombia's research system was designed to focus on ecosystem health, not on urban environmental issues. Of the four research institutes, none focus primarily on industrial pollution and human health. Only IIAP's research agenda addresses some of these concerns (*Contraloría* 2002b).

Research topics aside, an open question is whether the current configuration of four research institutes and one data collection institute is optimal, given chronic funding constraints. Although an assessment of the quality and quantity of research produced in each of the four research institutes is beyond the scope of this study, there is a general recognition in Colombia that some institutes have performed much better than others.

6.6. National Parks System

By way of caveat, we note that unlike other parts of Section 6, which incorporate information from interviewees with differing perspectives and affiliations, this subsection uses information gleaned from interviews with members of a single institution – Colombia's National Parks System.

6.6.1. Background

Colombia's National Parks System (*Sistema Nacional de Parques Nacionales*) comprises 49 protected areas that fall into four categories: (i) national natural parks, (ii) flora and

¹⁹ Notwithstanding the above comments, the von Humboldt Institute does have a very direct tie to MAVDT policymakers. MAVDT contracts out several specific functions to the von Humboldt Institute. Among these is implementing the national biodiversity policy. Twenty-seven members of the von Humboldt Institute's staff are currently on contract with MAVDT (personal communication with Fernando Gast Harders, December 2003).

fauna sanctuaries, (iii) unique natural areas, and (iv) forestry reserves. These protected areas occupy approximately 9% of Colombia's territory and include 30% of the headwaters (Ministry of Environment, UAESPNN 2002; UNEP 2004). Until 1993, protected areas were administered by an office of INDERENA. Law 99 placed the system under the control of an independent office attached to MMA (Law 99 Art. 5). As of 2002, the National Parks System employed a total of 364 staff and 132 contractors (MAVDT 2004).

6.6.2. Rule of law, overlapping boundaries, and innovative protection strategies

By most accounts, the greatest challenge facing the National Parks System is enforcing regulations that restrict certain land uses in the parks. The principal obstacle to enforcement is lack of rule of law. Recent IACHR reports highlight a continuing inability of the Colombian government to enforce law in areas of armed conflict (IACHR 1999, 2003). According to the director of National Parks System, fully 79% of the area of the system is occupied or affected by armed groups, including guerillas, paramilitaries, and narcotraffickers. Most deforestation in parks is due to narcotraffickers, guerillas, and shifting agriculture.

A related problem is that park boundaries often overlap with other legally designated areas that either explicitly or implicitly allow land uses inappropriate for protected areas. For example, according to the director of the National Parks System, indigenous and black communities have some form of property rights in half of the national parks in the Pacific region.

Given those problems, conventional command-and-control regulation is impractical, and therefore the National Parks System relies on some unconventional protection strategies.

CONSENSUS BUILDING AND COMANAGEMENT. To the extent possible, the National Parks System attempts to work with communities in and around the parks to create incentives for conservation. One such strategy is comanagement – empowering local groups with authority to enforce restrictions on land use (Riasgos 2002). Working mostly with indigenous groups, the National Parks System relies on this strategy in a quarter of Colombia's parks.

BUFFER ZONES. The National Parks System also emphasizes establishing buffer zones around parks. It resettles households located inside parks to these buffer zones and works with both transplanted and existing households in the buffer zones to increase incomes and enhance social stability, thereby diminishing incentives for encroachment in protected areas. The system also works with households in buffer zones to improve

awareness of land-use restrictions inside the parks and create incentives for enforcing these restrictions.

Although important, this strategy faces a number of obstacles. First, the system lacks funds needed to resettle households. Second, the compensation households receive for resettlement may create perverse incentives for encroachment. Third, there is a lack of coordination with CARs, partly because the three-year term for CAR directors disrupts continuity. Given these challenges, buffer zones remain relatively rare.

CORRIDORS. The National Parks System works with CARs to create corridors between national parks. These corridors have ecological benefits for biodiversity protection.

6.6.3. Funding

INSUFFICIENT FUNDS. As discussed in Section 4.2.5, funding for the National Parks System has declined dramatically in recent years. Park funding is generated by three sources: fees charged for ecotourism within the parks, the national budget, and international sources. All three sources have shrunk in recent years. Both ecotourism and international aid have fallen off because of continued violence and social instability. Gómez Torres (2003) concludes that the National Park System has not been able to secure funding adequate to protect Colombia's parks. According to its director, the system barely has enough funding to cover operations, and none to finance expansion.

REFORMS TO LAW 99. One option suggested for raising funds domestically is to channel some of the revenue from the watershed protection fee for water users, created under Law 99, to the National Park System. Currently, the revenue from this fee goes to CARs. However, according to the director of the National Parks System, part of the revenue should rightfully accrue to the National Parks System, since it provides nearly \$20 million in watershed protection services.

6.6.4. Relationship to CARs and MAVDT

One theme of the ongoing debate about reforming Law 99 concerns administration of the National Parks System. Currently, the system is a semiautonomous unit affiliated with MAVDT. The director of the National Parks System argued both that it needs to be better integrated with MAVDT and that it needs more autonomy. On the one hand, he said that better integration with MAVDT would enable the ministry to promote park policies more effectively. Currently, the National Parks System has to rely on MAVDT to enforce land-use restrictions, and this process is often highly inefficient. On the other hand, however, he said that the system needs more autonomy so that it can raise its own funds and have more control over administration of its more distant parks.

CARs are now lobbying for control of the parks on the grounds that if the system does not have the resources to administer protected areas, then CARs should control them. The director of the National Parks System considers this argument a political gambit – a bargaining position on the part of CARs – designed principally to head off the National Parks System's claim on the revenue from the new water fee.

6.6.5. Desired reform

The National Parks System director mentioned three changes needed to bolster the system. First, regulation of buffer zones should be advanced legally. Second, the system needs more funding. Finally, the government needs to work with complementary institutions to raise the income and social stability of people living in and around the national parks.

6.7. Control organizations

6.7.1. Procuraduría General

Section 3 discusses the role within SINA that Law 99 envisions for the *Procuraduría General*. Interviews with the staff of the Delegate *Procuraduría* for Environmental Affairs provided additional information about the role that the *Procuraduría* actually plays in Colombian environmental management. According to interviewees, the *Procuraduría General* views its central function as preventing, rather than punishing, abuse of office and failure to implement policy.

Within the *Procuraduría*, the Delegate *Procuraduría* for Environmental Affairs has responsibility for oversight of all environmental authorities in Colombia. Nine lawyers and three technical people staff the office. Inadequate staffing is viewed as a serious constraint on the capacity of the delegation to carry out the office's functions. The *Procuraduría* hopes that this deficiency can be corrected, in part, by an agreement among *Fiscalía*, *Contraloría*, and *Procuraduría* to share evidence.

The Delegate *Procuraduría* for Environmental Affairs chooses specific foci each year. For example, in 2003, it focused on solid waste, wastewater treatment plants, and operation of slaughterhouses. To strengthen preventive oversight at the regional level, the Delegate *Procuraduría* for Environmental Affairs is trying to implement environmental audit procedures for the CARs. This effort has been hampered by a lack of reliable, time-series data on the state of the environment and natural resources. In the past, the Delegate *Procuraduría* for Environmental Affairs has also focused on investments by departments and CARs of revenues earmarked for environmental management.

The departmental *Procuradurías*, rather than the national *Procuraduría*, tend to bring disciplinary actions. Within their jurisdictions, these offices have oversight of

environmental management as well as all other government functions. Each departmental *Procuraduría* is autonomous in selecting its area of work. As a result, there is no assurance that they will focus on environmental concerns.

6.7.2. Contraloría General

Environmental staff within the *Contraloría* flagged two performance-related concerns. First, their capacity to carry out oversight has been constrained by a lack of environmental indicators. Specifically, the lack of indicators has impeded program evaluation. Second is a closely related issue: the *Contraloría* has difficulty reconciling heterogeneous data from the various agencies involved in environmental policy, including DNP, MAVDT, the National Administrative Statistics Department (*Departamento Administrativo Nacional de Estadística, DANE*), and the *Contraloría* itself. Finally, the *Contraloría* has also been hampered by MAVDT's failure to approve methods of environmental valuation.

6.7.3. Control organizations in general

A recent study of Colombian control organizations found that laws governing the appointment of attorneys and comptrollers general, though intended to ensure the independence of these institutions – in particular the practice of having Congress and municipalities appoint the directors – often have had the opposite effect: they tend to indebt these officials to political bodies. Effectively, these legal provisions have reinforced traditional tendencies of Colombia's large, bureaucratic control organizations to be targets for “consolidating cronyism and repaying electoral favors” (Transparency for Colombia Corporation 2001, 13). Stakeholders interviewed for this report concurred with this assessment.

A recent survey on corruption in Colombia found the *Contraloría General* ranked low on the presence of corruption and high on level of meritocracy (Saez 2003b). The same survey found the *Procuraduría General* ranked somewhat higher for corruption and lower on meritocracy. Forty percent of respondents said the *Procuraduría's* office was honest and another 20% responded that they did not know (Saez 2003b).

Both Saez (2003) and National Integrity Systems (2001) found that corruption is much more of a problem in local offices of control organizations than it is in national offices. Our interviewees' comments generally comported with this finding. In particular, several of our interviewees stated that politicization – the use of institutional resources to achieve political goals rather than to carry out mandates of the control organizations as defined by law – is a long-standing problem at control organizations, particularly at the departmental level. However, our interviewees also stated that the level of politicization appears to be declining, at least at the national level. In addition,

interviewees noted that the control institutions are no more political in dealing with environmental matters than they are with other areas.

INDICATORS. As discussed in Section 5.2, SINA and the control organizations in particular lack adequate performance indicators. As a result, the national control offices use administrative indicators of performance, rather than indicators based on environmental quality. Several interviewees argued that CARs are at least partly responsible for the slow progress in developing indicators. Under current law, the control organizations can set in motion procedures to remove CAR directors general for failure to comply with CAR action plans. This creates a strong incentive for CARs to block implementation of effective indicators.

OVERALL ASSESSMENT. Our impression, based on interviews with people inside and outside the national control offices, is that these offices have competent, professional staff interested in carrying out their charges. We cannot assess the accuracy of evidence on politicization, but it is pervasive enough to lead us to believe that politicization is in fact a problem. Just as important, on the face of it, the national control organizations' roles in SINA exceed the resources allocated to them, particularly the Delegate *Procuraduría* for Environmental Affairs. The Delegate *Procuraduría* for Environmental Affairs' attempt to address lack of capacity by agreeing to share evidence with other control organizations seems inadequate, although perhaps it is the only feasible option available. These organizations provide one of the few mechanisms that the national government has to help ensure that local governments actually implement their plans. For this reason, their integrity and their capacity are central to the ability of SINA to accomplish its environmental management goals.

6.8. Courts

As discussed in Section 3, the Constitution of 1991 and Law 99 of 1993 assign courts a central role in SINA. Under the 1991 Constitution, every citizen has the right to file public actions in defense of the Constitution and the law (Const. Art. 40) and to petition authorities (Const. Art. 23). The Constitution and implementing laws and decrees create three causes of action that citizens can use to demand protection of constitutional rights to a healthy environment and implementation of environmental law (Const. Arts. 77, 86, 87, 88; Law 393 of 97; Law 472 of 98; Law 99 of 93 Art. 77; Decree 306 of 92; Decree 2591 of 92). These formal provisions for access to justice to enforce environmental rights are extraordinary.

We found mixed evidence regarding the effectiveness of this access, however. Based on criteria developed by the Access Initiative, a major international effort to promote public participation in environmental management, in order to guarantee access to justice, a national legal system needs “(i) constitutional guarantees for access to justice; (ii) impartial administrative, judicial, and alternative venues for resolution of conflicts

and remedy; (iii) affordable and timely legal services; and (iv) active education by government on the participation and environmental rights of the public and how they can use the legal system to protect those rights" (Access Initiative 2004). A number of these requirements are lacking in Colombia.

First, although the 1991 Constitution guarantees access to justice, recent survey research described in Seligson (2001) suggests that relatively few Colombians are aware of their right to access. Less than 30% of respondents to a recent survey knew of *acciones de tutela* even though this particular action was by far the best known – less than 1% of respondents were aware of the availability of public hearings or other causes of action before the courts.

Second, it is not clear that Colombian courts are impartial. Recent surveys and studies suggest that Colombian courts are perceived to be relatively free of overt corruption, although biased in favor of the wealthy and against the interests of the poor. A recent Gallup International poll found Colombians much more concerned about corruption in political parties (38%) than courts (3%) (Transparency International 2003). Saez (2003a) found "adequate levels of integrity" at higher levels of the Colombian judicial system. In the lower courts, however, 74% of survey respondents indicated that bribes were often used to ensure timely resolution or favorable outcomes (Saez 2003a). Moreover, 70% of both businesses and individual respondents believed that judicial decisions were biased in favor of the rich (Saez 2003b).

Third, Colombian courts are not free of intimidation. A 1999 OAS report focused on criminal law and human rights in Colombia noted a continuing problem of violence against judges, prosecutors, and witnesses, including not-uncommon killings (ICHD 1999). ICHD notes that this activity continued in 2003, particularly in areas plagued by armed conflict (ICHD 2003). Stakeholders interviewed for this report stated that evidence is sometimes destroyed and witnesses and attorneys are sometimes intimidated or harmed in environmental lawsuits. Far less dramatic, but still important, an NGO interviewee commented that Colombian NGOs generally do not join litigation against the government – or even private interests favored by the government – because they do not want to jeopardize state financial resources, upon which they depend, or their access to government decisionmaking institutions.

Fourth, and perhaps most important, the Colombian court system lacks capacity to handle all the cases brought before it. By Latin American standards, the Colombian judicial system is well financed (Saez 2003a). Yet demands on the system have outstripped its ability to handle cases. The 1999 OAS report notes long-standing problems of excessive caseloads, limited budgets, and outdated procedural codes (ICHD 1999). Saez (2003a) also noted chronic congestion of Colombian court dockets but attributed the problem to increasing caseloads coupled with a lower level of judicial

productivity than is found in other Andean countries. In the area of criminal justice, ICHD found inadequate numbers of prosecutors, judges, and public defenders to handle the number of crimes committed each year (ICHD 1999). As noted above, in our interviews, we were struck by the low staffing level in the Delegate *Procuraduría* for Environmental Affairs Office.

Notwithstanding those four problems, most evaluations of *acciones de tutela* are positive. Survey research has indicated that *acciones de tutela* are the most widely used causes of action and are viewed as the most effective means of citizen control over government (Seligson 2001). Saez (2003a) found that the Constitutional Court, which hears *acciones de tutela* and was created by the 1991 Constitution, has proved to be a very attractive forum. Through 2001, the number of claims brought as *acciones de tutela* in all areas grew at a rate of 130% per year. Over 400,000 such actions were brought in 2000 (Saez 2003a). Furthermore, petitioners were bringing *acciones de tutela* in the Constitutional Court instead of in normal jurisdictional channels because decisions there are faster and, in the view of some commentators, more principled. Petitioners have reason to see the Constitutional Court as a more attractive venue than traditional civil courts. Between 1992 and 1995, the Constitutional Court granted almost 40% of the *acciones de tutela* brought before it, while the highest court in the conventional civil courts system held for petitioners in less than 7% of cases (Saez 2003a). It is not clear how effective the traditional civil system is for resolving environmental disputes. Today, nonconstitutional civil courts in Colombia are disproportionately used to collect debts (Saez 2003a).

A 2002 *Contraloría* report on public participation found that *acciones populares* are widely used. Seventy-five percent of those bringing *acciones populares* were individuals. The *Contraloría* concluded that provision of financial incentives for the party bringing *acciones populares* increased the number of these actions brought (*Contraloría* 2002b).

Little evidence was available on the direct impact of judicial decisions on environmental quality or policy, and it is unlikely that clear quantitative evidence exists. Among our interviewees, there were mixed views of this impact. Many of our interviewees said that the primary benefit of judicial decisions in the environmental sector is to clarify and fill gaps in unclear or incomplete statutes and regulation. There was some skepticism voiced by the NGOs and academics we interviewed about the impact of court decisions on government environmental policy. However, one interviewee pointed to courts' willingness and ability to direct CARs to take specific actions to protect the environment as an indication that Colombian courts have a degree of power to influence environmental outcomes. Several of our interviewees noted that *acciones de tutela* have had a significant impact. Concern was raised that because of the number of *acciones de tutela* being brought, efforts are being made to limit access to the courts.

6.9. Public participation and nongovernmental organizations

Colombia's 1991 Constitution and Law 99 create numerous mechanisms for public participation. Here, we discuss the performance of mechanisms for participation in policy formulation and policy implementation.

6.9.1. Policy formulation

As discussed in Section 3.2.6., the primary mechanism provided under Law 99 for public participation in environmental policy formulation is to ensure that NGOs serve on the boards and councils of advisory bodies, at both the national and the CAR level. At the national level, Law 99 guarantees NGOs seats on the National Environmental Council and the Technical Advisory Council (Law 99 of 93 Arts. 14 and 11). At the regional level, Law 99 mandates that the board of directors of each CAR include two representatives of environmental NGOs (Law 99 Art. 26). To be eligible to serve on the board of directors of a CAR, environmental NGOs must be approved by the mayor of the municipality in which they operate (Law 99 Art. 106).

This NGO-focused approach to ensuring public participation in policy formulation has yielded mixed results. Although Colombian NGOs have proliferated since passage of the 1991 Constitution – there are more than 5,346 registered NGOs in Colombia (Transparency for Colombia Corporation 2001) – this participation does not necessarily indicate that Colombia has strong NGOs capable of serving as the public's voice in environmental policymaking. Below, we review the performance of Colombia's environmental NGOs at the national and regional levels.

NGO PERFORMANCE AT THE NATIONAL LEVEL. In general, national-level NGO participation in SINA has been limited. Two factors have contributed to this state of affairs: a general weakening of Colombia's national-level NGOs, and a diminution of opportunities for effective participation.

To understand why national-level NGOs have grown weaker in recent years, it is helpful to review the history of the sector. In 1993, a new NGO called ECOFONDO was created, primarily to allocate revenues from a multimillion-dollar debt-for-nature swap

to other Colombian NGOs.²⁰ With that influx of funding, new environmental NGOs proliferated. Many were small, regional organizations focused on concrete local environmental and natural resource management projects.

Subsequently, many national-level NGOs, some of which helped create SINA – including *Fondo Fen*, *Gerencia Verde*, *Fundacion Alma*, *Colegio Verde de Villa de Leyva*, and *Fundación FES para el Medio Ambiente* – withered and eventually disappeared. The emergence of ECOFODO may or may not have been a causal factor. One clear reason for the weakening of national-level NGOs has been a scarcity of domestic funding. Since ECOFONDO – the primary source of domestic NGO funding – mainly supports local environmental management projects, NGOs with more national outlooks must seek funding from other sources, primarily international ones.

A second factor in the weakening of national-level environmental NGOs has been a scarcity of formal and informal avenues for NGO participation in the policy process. As for formal avenues, NGO representatives interviewed for this study universally described the meetings of the National Environmental Council as a mere formality. Actual consultation and decisionmaking take place informally before the council meetings.

Historically, NGOs have depended largely on informal participation mechanisms, such as personal relationships with people inside MMA. Because Colombia does not have a formal notice-and-comment rulemaking procedure or grant extensive rights to request governmental information, such informal mechanisms constitute NGOs' main source of information about new policies and regulations – information that NGOs need to participate effectively in the policy formulation process. Interviewees agreed that such informal information flows have diminished significantly in recent years. Apparently, NGOs no longer have the same access to key decisionmakers that they enjoyed in the past. Moreover, there is a perception that voices from the NGO community are no longer welcome – those who express critical opinions are not invited to meetings or informed of contemplated changes.

²⁰ ECOFONDO was created in 1993 by group of NGOs working with DNP and INDERENA. The goal was to use millions of dollars in funds generated by debt-for-nature swaps with the United States and Canada to create a national fund for an environmental NGO and, in doing so, help enhance the role of community organizations in managing environmental projects. ECOFONDO mainly serves as a source of support for local NGOs conducting concrete local environmental management projects. ECOFONDO refers to itself as an “organization of environmental organizations.” It views its role as facilitating communication among NGOs and serving as a forum for cooperation and exchange between NGOs and the Colombian government. The minister of MAVDT and the director of National Planning both serve on ECOFONDO's board of directors. ECOFONDO is the principal point of contact between the national government of Colombia and other NGOs. ECOFONDO is now the major domestic financing mechanism for NGOs in Colombia. It has about 400 projects worth roughly US\$80,000 each.

NGO PERFORMANCE AT THE REGIONAL LEVEL. NGO participation at the CAR level is widely recognized to be particularly problematic. For example, the *Contraloría General* found that the use of representatives from NGOs on CAR boards of directors has amounted to cronyism: spurious NGOs are often created by local political and business interests to fill seats on CAR boards (*Contraloría* 2002b). Lack of regulation from MAVDT has contributed to this problem (*Contraloría* 2002b).

Most of our interviewees agreed with the *Contraloría's* findings. There was wide agreement among interviewees that participation of NGOs on CAR boards of directors has been unsuccessful, mainly because of clientelism, and in particular the problem of spurious NGOs. They said that this problem can build on itself: legitimate NGOs see participation on the CAR boards as problematic and, as a result, decline to participate. A few interviewees insisted that such problems are not universal, however. They pointed out that the quality of governance varies widely across CARs and in those that work well, NGO participation is a functional vehicle for public participation.

NGOs working at the local level, particularly in rural areas, also confront a lack of security because of terrorists – and a perception by the government that NGOs are sympathetic to terrorists (Integrity International 2001).

Notwithstanding problems with NGO participation on CAR boards of directors, several interviewees believed that NGOs are very important at the local level – much more so than at the national level. Many NGOs are very close to local communities and are engaged in implementing concrete, small projects. But several respondents agreed that these NGOs are not strong enough or organized enough to play a significant role at the national level.

Several interviewees expressed concerns about elements of the Uribe administration's proposed CAR reforms. The proposal to require NGOs to have been in existence for two years before being eligible to serve on a CAR board was universally decried by our interviewees. Interviewees said that developing criteria related to actual activities of the NGOs and continuing to work to improve governance in CARs would have a better chance of improving NGOs' participation in CAR policymaking. Not surprisingly, interviewees also decried the proposal to reduce the number of NGO representatives on the CAR boards of directors. Interviewees said that it would be better to work to increase transparency in the management of the CARs and strengthen participation by legitimate NGOs.

ACCESS TO INFORMATION AND EARLY NOTIFICATION. The continuing limitations of environmental NGOs in Colombia raises the question whether public participation in policymaking should be focused on NGOs, regardless of how strong they are. Standard guidelines for national public participation systems, such as those developed by the

Access Initiative, favor the creation of mechanisms for participation that do not specify which members of the public should participate, but rather provide all members of the public with a means of being involved in decisionmaking that will affect them (Access Initiative 2004).

A key element in standard principles of public participation is early notification of the government's intention to make important policy changes. Early notification creates an opportunity for the public to comment on the government's proposal. Colombia does not currently have a consistent, well-functioning system of prior notification of the government's intention to take major action, such as promulgation of major regulations. Nor is there systematic provision of guaranteed opportunities for public comment. Such mechanisms do exist in the case of environmental licenses and permits, but not for other governmental actions (Law 99 of 93 Arts. 49–62). Law 489 of 1998 grants government agencies the discretion to hold public hearings but does not guarantee citizens the opportunity to comment on proposed policy changes.

Stakeholders from national NGOs who were interviewed for this report stated that in the past, they received informal early notification of major actions from networks of personal relationships. Unfortunately, as discussed above, this informational flow has diminished in recent years. Public notice and comment procedures are intended to prevent precisely this type of problem. Such procedures limit the extent to which participation in public decisions is constrained to an elite policy circle.

6.9.2. Policy implementation

As discussed in Section 3.2, under Law 99, the primary mechanisms for public participation in policy implementation are interventions in licensing actions and public hearings over licenses. Here the formal procedures do appear adequate. However, implementation of these procedures is inadequate. Use of hearings varies widely across CARs. Between 1998 and 2002, 40% of CARs did not have any public hearings; 11% had seven or more (*Contraloría* 2002b). Lack of regulation specifying the scope and applicability of public hearings has made their use almost incoherent (*Contraloría* 2002). Each environmental authority has a different notion of how the hearings are to be used, and this has contributed to corruption (*Contraloría* 2002).

Many of the stakeholders interviewed for this report concurred with the *Contraloría's* assessment. Concern was also expressed that authorities often make little effort to show how the information gathered at hearings was considered in reaching a decision on the permit or license, as is required by Law 99. NGO representatives did say that the hearing process works better in those localities where there are strong NGOs.

6.10. Institutional Learning

Why are employees reluctant to report to managers that certain organizational activities are not being effectively carried out? Why don't managers reveal to senior directors that key divisions are not performing well or that the goals established for these divisions may not be achievable given available human and financial resources? Over the past 50 years a substantial academic literature has developed on "institutional learning" (also known as organizational learning), which suggests that the inability to uncover and, ultimately, to "fix" such institutional problems often arises from faulty organizational cultures. Whereas previous subsections of this chapter have mainly presented evaluations of the performance of individual SINA institutions, this final cross-cutting subsection attempts to apply the lessons from the literature on institutional learning to the foregoing performance evaluations.

As Levitt and March (1988) have noted, theories of institutional learning can be distinguished from theories of analysis and choice. The latter emphasize anticipatory calculation and intention. They typically envision a four-step process: (i) objectives are systematically identified and ordered; (ii) all possible means of achieving these objectives are identified; (iii) in-depth evaluation of each possible means of achieving these objectives is undertaken; and finally, (iv) choices are made to maximize the likelihood of success. Although such an approach has a clear conceptual appeal, many observers believe that it is not a particularly realistic representation of the way organizations actually function. Rather, because of limited human and financial capacities, lack of information, time pressures, and political, legal, and other real-world constraints, organizations rarely adopt such anticipatory approaches to decisionmaking.

In contrast to theories of analysis and choice, theories of institutional learning recognize the less formal and more incremental nature of most decisionmaking. Decisionmaking is viewed as a succession of comparisons between alternative actions that involves feedback from the relevant environment. The feedback is required to evaluate the effectiveness, efficiency, and other elements of the decision and provides information for the next action or decision. Decisions are almost always made on the basis of incomplete information.

Institutional learning builds on three basic findings drawn from behavioral studies of organizations. The first is the simple notion that behavior in an organization is based on routines (Cyert and March 1963; Nelson and Winter 1982). Most often, action involves employing already-established procedures in particular situations more than it does carefully evaluating alternative choices. The second is that the actions of an organization are heavily dependent on history (Lindblom 1959; Steinbruner 1974). Routines are generally based on interpretation of the past more than anticipation of the future. Routines change incrementally in response to feedback about results. The third

finding is that organizations are generally oriented toward reasonably well-identified targets (Simon 1955; Siegel 1957). Behavior depends on the relation between the observed outcomes and the targets.

One application of these basic findings derives from the work of Argyris and Schon (1978), who focus on the aspect of institutional learning involving the detection and correction of errors. When something goes wrong, they suggest, an initial reaction is to look for another means of accomplishing the initial goals. In other words, the initial goals or plans are not questioned. Argyris and Schon (1974) call this “single-loop” learning. An alternative response is to question the goals themselves. This “double-loop” learning may lead to a change in the goals and, thus, a shift in the way strategies are framed. Specifically, they state,

Single-loop learning is like a thermostat that learns when it is too hot or too cold and turns the heat on or off. The thermostat can perform this task because it can receive information (the temperature of the room) and take corrective action. Double-loop learning occurs when error is detected and corrected in ways that involve the modification of an organization's underlying norms, policies and objectives (Argyris and Schon 1978, 2-3).

Single-loop learning is present when goals, values, frameworks, and to a significant extent, strategies are taken for granted. The emphasis is on making the strategy more effective. Double-loop learning, in contrast, “involves questioning the role of the framing and learning systems which underlie actual goals and strategies” (Argyris and Schon 1978). Single-loop learning is less risky for the individuals in the organization and for the organization itself. It generally involves greater control. Double-loop learning is more fundamental and potentially more risky – the basic assumptions behind ideas or policies are confronted.

Ideally, sufficiently detailed information would be available from this report and other research on the Colombian environmental management system to systematically apply the lessons of the literature on institutional learning to the operation and performance of the SINA institutions. Unfortunately, such information is not available at this time. Nonetheless, based on the information that is available, three broad-brush observations can be made.

First, in theory some of the basic building blocks of a systematic goal-setting and performance evaluation – what Argyris and Schon would call single-loop learning – have either already been established within SINA or are supposedly in the process of being established. Probably the most important goal-setting mechanism is the extensive planning process, which requires virtually all public-sector SINA entities to act in accordance with the National Development Plan. Of particularly importance is the

requirement that CARs draft 10-year, 3-year, and 1-year plans. SINA also has, or is in the process of establishing, mechanisms to provide systematic feedback on institutional performance:

- the *Controlaría* is responsible for fiscal oversight and for evaluating the state of the environment and natural resources;
- the *Procuraduría* is responsible for providing feedback on the extent to which SINA institutions are performing the roles assigned them by law;
- MAVDT, in theory, oversees and coordinates the activities of the CARs, the research institutes, and the National Parks System;
- the courts provide a forum for citizens and groups to bring environment-related legal actions;
- NGOs provide feedback on institutional performance via a variety of councils and boards; and
- independent consultants sporadically report on the performance of SINA.

An absolutely vital element of all of those feedback mechanisms is the national system of environmental quality and institutional performance indicators.

A second broad-brush observation is that there is clearly considerable room to improve the operation of those single-loop goal-setting and feedback mechanisms. Previous sections of this report identify important problems in each of the mechanisms listed above. As discussed in Section 6.4.4, SINA lacks a systematic mechanism for priority setting across environmental programs and subsectors, such as forestry, air pollution, water resources, and sanitation. As discussed in Section 5, a reasonably effective national system of environmental quality and institutional performance indicators does not yet exist. As discussed in Section 6.7, the control organizations are hamstrung by a lack of resources. As discussed in Section 6.1.3, MAVDT lacks adequate mechanisms for ensuring that the feedback it provides to CARs has any real impact. As discussed in Section 6.9, NGOs are relatively weak at both the national and the regional levels. Finally, we would note that although, in principle, systematic mechanisms exist for setting goals and evaluating the performance of CARs, there few such mechanisms for evaluating the performance of MAVDT.

Third, overall, it is difficult to detect a great deal of progress in evaluating and modifying SINA's fundamental goals. That is, there is limited evidence of double-loop learning. For example, despite mounting evidence of widespread, serious health effects associated with urban air pollution, little progress has been made in this area. Notwithstanding the weak air-monitoring system, it is clear that high levels of fine particles along with other pollutants are present in the larger urban areas, where the majority of the population lives. Yet few resources have been devoted to identifying the full extent and nature of these air pollution problems, let alone devising or

implementing viable mitigation strategies. A similar case can be made concerning the nation's drinking water. In general, there remains a strong – some might say too strong – focus on “green” (natural resource) issues, which have long been the dominant concern of the environmental management system. Despite the growing scientific evidence on the importance of “brown” (urban pollution) issues as major factors in public health, the environmental management system has been slow to modify its broad goals. Arguably, although these observations must be seen as general, double-loop learning appears to be relatively weak. The challenge for the future is to integrate the newest scientific information into the management system and reorient the system goals to reflect the greatest threats to human health and the environment.

7. The U.S. Experience with Environmental Decentralization

Ideally, it would be desirable to assemble comprehensive case studies of environmental decentralization in a number of countries, both developed and developing, and to use this information to shed light on Colombia's experience with CARs. However, assembling such comprehensive data is beyond the scope of this study. Therefore, for the purpose of comparative analysis, we focus on examining the U.S. experience, for which relevant data are readily available. We present a detailed discussion of the U.S. experience in Appendix B. In this section, we outline those aspects of this case study that are particularly relevant to Colombia.

At the outset we note that despite the many obvious economic, institutional, and environmental differences between the United States and Colombia, there are also important similarities. Both the United States and Colombia are large, geographically diverse nations. In the United States, the environmental and resource problems, along with economic and institutional capabilities in the largest cities, such as Los Angeles, are substantially different from those in medium-sized cities like Cleveland and Philadelphia. A similar situation exists in Colombia, where problems and capabilities also vary considerably across cities like Bogotá, Cali, Medellín, Barranquilla, and Cartagena. Also, in both countries the issues in rural areas and smaller cities are generally quite different from those in large urban areas. Not surprisingly, the challenges that this within-country variability poses for environmental management are considerable.

7.1. Allocation of responsibilities among levels of government

In the United States, environmental laws are enacted and environmental programs are managed at all levels of government: federal (i.e., national), state, and local. The laws pertaining to many major environmental problems – for example, air, water, and hazardous waste pollution – are typically passed at the national level. The states then pass laws that are consistent with the national laws. Sometimes these state laws are also designed to address environmental problems specific to the state.

The environmental protection roles assigned to the various levels of government in the United States reflect not only the constitutional division of responsibilities between the national and state governments, but also an efficient and logical allocation of responsibilities. For example, most environmental research is directed at the national level (by the Office of Research and Development in the Environmental Protection Agency, EPA) and supported by academic institutions and private researchers throughout the country. Conversely, an environmental permit for a specific facility is usually better negotiated by a level of government closer to the facility. These local government officials have a much better understanding of the local environmental

situation, the stakeholders involved (e.g., NGOs), and cultural or economic considerations.

A second factor that affects the allocation of responsibilities between the national and state authorities is the management capacity of environmental regulatory agencies at the various levels of government. From the late 1960s through the early 1980s, when initial versions of many of the major U.S. environmental laws were being passed, environmental programs were generally more centralized at the national level than they are today. For example, EPA issued more permits and conducted more inspections than it does currently. One reason for this centralization was that for many years there were more highly trained environmental professionals at EPA than in the state agencies.

Legal mechanisms have been created to accommodate increasing levels of regulatory capacity in state environmental regulatory agencies. For example, to manage the national program for point sources of water pollution – the National Pollutant Discharge Elimination System (NPDES) – a state could be officially “delegated” the program based on having demonstrated that it met certain requirements, such as having laws or regulations with adequate levels of penalties for noncompliance, and employing a sufficient number of properly trained environmental professionals to write the permits, perform the inspections, and take appropriate enforcement actions. Thus, during the early stages of the NPDES program in the 1970s, EPA itself issued many of the initial permits and enforced these permits. Many states passed the needed laws and hired staff as quickly as their processes would allow, and by the early to mid-1980s a majority of the states were officially delegated the NPDES program. EPA then assumed an “oversight” role.

7.2. Growth in environmental management capacity at the state level

To fully appreciate the nature of decentralization of environmental management programs in the United States, it is essential to understand an overarching trend – the increasing strength of state programs during the past 30 to 35 years. In the early 1970s, EPA tended to have staff that was more knowledgeable than its state counterparts about environmental protection. The staff had a mandate to ensure rapid implementation of the newly enacted national environmental laws. Many states at that time did not have laws and regulations that were consistent with the new national laws. Also, staff at the state level often lacked the authority (and the expertise) to administer these programs. During the past three or four decades, the states have developed the needed laws, staff expertise, and processes, and some states are now stronger and more progressive in certain areas than EPA. Nonetheless, state performance is still somewhat uneven. There are “strong states” and “weak states” throughout the country, and within any given state there are often stronger and weaker programs.

7.3. Planning

A number of planning approaches and systems of checks and balances have been developed to help ensure that EPA and the states successfully implement the national environmental programs. For example, in 1993 Congress passed the Government Performance and Results Act (GPRA). This law requires that each federal agency develop a strategic plan with measurable goals and objectives. EPA and other federal agencies must report to Congress on their progress in meeting these goals, and this planning and performance tracking program is considered in determining the level of funding that the agencies receive. In addition to EPA's agency-wide strategic plan, each of EPA's 10 regional offices has developed a strategic plan that reflects its specific environmental issues.

Since the 1970s, EPA and the states have experimented with ways to engage the federal and state levels of government in joint planning and priority setting. Since the passage of GPRA, these activities have received additional focus. Both EPA and the states recognize that implementing numerous environmental programs with limited government staff requires a common vision and a sense of federal-state teamwork. EPA and the states generally view a structured planning process as an opportunity to establish joint priorities based on the best environmental data, allocate responsibilities between EPA and the states, build trust and positive relationships, and provide a forum for EPA and the state officials to discuss areas of mutual concern.

7.4. Principles of national-regional coordination

Since EPA was formed in 1970, EPA-state relationships have been a major issue. These relationships have evolved over time and reflect a number of factors, including the philosophy of the political administration in office. However, certain overarching principles have emerged and, although not formally adopted, seem to have been accepted by EPA and the states as important to the success of U.S. environmental programs. Four of these principles are discussed here.

NEITHER EPA NOR THE STATES CAN BE SUCCESSFUL WITHOUT A STRONG WORKING RELATIONSHIP. Both EPA and its state counterparts have the same goal – protecting human health and environment. Over time, the methods for reaching this goal have been agreed upon by EPA and the states. However, in some areas, the means to the goal are still subject to considerable debate. Examples of ongoing contentious issues include the following: (i) Should EPA and the states try to ensure compliance with environmental requirements primarily by aggressive enforcement against the regulated community, or by providing assistance to entities that have compliance problems? (ii) How much information should the states be required to report to EPA? (iii) To what extent must the states follow EPA “guidance,” especially guidance that may go beyond the specific requirements of the legislation or regulation?

Over the years, many committees and processes have been established to debate those issues. The Environmental Council of the States (ECOS) is an influential organization that develops consensus state positions on various issues and negotiates these issues with EPA. Likewise, the leaders of the respective programs – air, water, and hazardous waste – at EPA and in the states also meet frequently to resolve issues unique to their area of responsibility.

THE NATION BENEFITS FROM CONSISTENCY IN IMPLEMENTING ENVIRONMENTAL PROGRAMS. One major reason for enacting environmental legislation at the national level is to ensure consistent application of environmental protection throughout the United States. Lack of consistent permit requirements or consistent penalties for noncompliance could potentially result in “pollution havens” that would give unfair economic advantages to particular industries or states. Despite consensus on this point, consistency in implementation has proven difficult to achieve as environmental professionals in the 10 EPA regions and 50 states are making different decisions on similar facilities. Indeed, some local officials argue that it would be folly to regulate every facility in the country in the same way, since some local situations are unique.

DECISIONS ARE BEST MADE BY THOSE CLOSE TO THE ENVIRONMENTAL PROBLEM. Over the years, the general principle of having environmental decisions made by a qualified authority close to the problem has become widely accepted. It is generally assumed that the states know the local environment, local stakeholders, and local political, economic, and social circumstances better than someone in a remote EPA office. EPA, however, is expected to know enough about state decisions made regarding major facilities to ensure that these decisions are consistent with national policy. This requires the good-faith sharing of information. In any case, the trend is definitely toward more delegation of national programs to the states. Indeed, for most major programs – air, water, and hazardous waste – the majority of the states have been delegated primary responsibility for implementing the programs.

ACTIVE STAKEHOLDER INVOLVEMENT AND SHARING OF ENVIRONMENTAL DATA ARE ENCOURAGED. The fourth principle that has emerged over the years is the desirability of openly sharing information and actively involving interested stakeholders in the decisionmaking processes. Therefore, EPA and the states have increasingly made available information on discharges and emissions, compliance, and ambient air quality. EPA and the states put much of these data on the Internet.

Although the four principles discussed above are now widely accepted in the United States, the art of managing EPA-state relations so that these principles are in proper balance during the daily interactions remains a challenge. The large majority of issues between EPA and the states are resolved amicably, but tensions exist. It is because of

such tensions that the various national policies continue to be debated and refined by EPA and the states.

7.5. Coordination mechanisms

This section describes some of the mechanisms used by EPA to coordinate the activities of the states.

7.5.1. State program grants

EPA provides the states with funding to implement the major national environmental programs. These funds usually represent 25% to 60% of the total state funds for the programs. The EPA grants typically are conditional and may require the particular state to issue a specific number of major permits, supply EPA with certain information, do special studies, or develop a specific policy that is consistent with national goals. The grant conditions are negotiated each year by EPA's regional offices and the states in their region. If the state does not meet the grant conditions, EPA has the authority to withhold some funding for the following year.

7.5.2. Audits and performance reviews

EPA headquarters reviews performance data from the EPA regional offices, which in turn review the performance of the states. In addition to reviewing performance data submitted by the states (increasingly in electronic form), EPA occasionally also audits performance by visiting the state offices, reviewing files, and interviewing state managers. Issues such as the quality control of information, adequacy of applying national standards and policy to state decisionmaking, and state-EPA working relationships are discussed. A written report is often produced by EPA and is reviewed by the state. EPA and the state then agree upon corrective measures where needed.

7.5.3. The dynamics of program delegation

As discussed above, most major programs are not delegated until the state demonstrates its capacity to administer the program in a way that is consistent with national standards. If a state does not meet these performance expectations, EPA reserves the right to take back the program. Citizens can petition EPA to rescind the delegation. Although discussions between EPA and poor-performing states are sometimes held, such actions are rarely taken by EPA, since it is in everyone's best interest to correct the performance problem. The states generally have many more staff than EPA does to administer the programs, and taking away state authority would be a political embarrassment to the state.

7.5.4. EPA's inspector general

The EPA inspector general often examines programs administered by EPA and the states if there are suspicions of fiscal mismanagement or program ineffectiveness. The inspector general is free of any EPA management control and can make her reports public. Such independent reviews also help ensure proper management by EPA and the states.

7.5.5. The influence of the media and NGOs

With the proliferation of information, the news media and nongovernmental organizations can conduct studies and analyses of EPA and state performance. The federal government's Freedom of Information Act allows any citizen, NGO, or other organization to review government reports or data (unless protected by the business confidentiality or enforcement confidentiality provisions of the act).

7.6. Implications for Colombia

Clearly, it is neither desirable nor feasible to attempt to impose the environmental management system adopted in one country on the very different economic, legal, and institutional circumstances prevailing in another nation. Like the United States, however, Colombia faces relatively large disparities in terms of both environmental priorities and institutional capabilities among its different urban and regional areas. It is important to note that the environmental management system in the United States has evolved considerably over the past three decades and will, no doubt, continue to evolve in the future. The need for a close working relationship between national and regional authorities, the desirability of relatively consistent application of the laws and standards throughout the country, an emphasis on decisionmaking at the local level wherever feasible, and active stakeholder involvement and data sharing are all important themes of the U.S. experience. When viewed in the appropriate context and applied with the appropriate caveats, current practices in the United States can serve as important reference points for future reforms to be undertaken in Colombia.

8. Review of Major Findings and Recommendations from Past Evaluations of SINA

This section briefly summarizes major findings and recommendations of selected past studies of various aspects of SINA. A number of these findings and conclusions have been referenced to provide support to points made in earlier sections. The main purpose of summarizing and compiling these studies here is to enable interested readers to compare the findings and recommendations of the present study (presented in Section 9) with conclusions developed by previous studies. The summaries of the studies are presented here roughly in chronological order.

8.1. Eduardo Wiesner. 1997. Department of National Planning. Administration Modernization Project. Financing of Public Sector, BIRF, and PNUD. Effectiveness of Public Policies in Colombia: A Neoinstitutional Analysis. January. Bogotá.

8.1.1. General conclusions

- Environmental management is best achieved by a unified institutional organization.
- It's easier to take advantage of positive externalities and to improve regional environmental management if CARs coincide – or tend to coincide – with the watershed basins.
- Although some CARs could reach agreements on integrated interinstitutional management, the question remains, what would stimulate them to actively seek such agreements? The response is orienting FONAM in this direction and promoting the development of investment projects around interjurisdictional externalities.

8.1.2. Institutional diagnosis

The institutional diagnosis looks at three principal considerations: (i) the macroinstitutional framework between government levels; (ii) consistency between watershed basins and/or ecosystems on one hand and with local environmental management institutions on the other; and (iii) financial articulation that integrates government levels and reinforces their respective strengths.

- With respect to the macroinstitutional framework, the diagnosis is positive. The current decentralized structure is correct and should be maintained.
- With respect to institutional consistency between CARs and ecosystems, the diagnosis is not favorable. Without a doubt, a serious inconsistency exists between the institutional instruments and policy objectives. The lack of correspondence between the geographic jurisdiction of many CARs and the

natural scope generates a systemic fault that adversely affects the management of the CARs and the system as a whole.

- With respect to the financial diagnosis, the judgment is not favorable. It is not entirely clear that the current system integrates the three levels of government and strengthens important local- and regional-level processes. Financial resources meant for SINA and National Environmental Council leadership capacity are poorly used. The Consejo Nacional Ambiental should have a more prognostic role in intersectoral coordination and consensus building for policies that are presented.

8.1.3. Action plan

- An action plan strategy should (i) strengthen the decentralized model and (ii) use the financial instruments to correct inconsistencies between the CARs jurisdictions and the environmental watershed basins.
- With respect to the first point, the strategy recommends maintaining the CARs' independence. Although from the "central" viewpoint there are upsetting developments, the process is moving in the correct direction and should be maintained.
- With respect to the use of financial resources, the proposed strategy is to use the National Environmental Fund (FONAM) to co-finance territorial efforts to resolve spillovers and induce regional cooperative agreements between CARs. There are certain high-impact projects that require supraterritorial support. Only a co-financing fund that lends resources that borrowers later pay back and that demands a minimum of financial and economic feasibility will induce efficiency.
- The plan of action involves using FONAM to achieve strategic objectives. FONAM will lend support for investments related to the National Development Plan, regional plans, and territorial action plans, and will co-finance private projects. It will also give priority to zones with low per capita incomes.
- Two considerations are very difficult to combine: distributional objectives and efficiency objectives. Neoinstitutional economics would insist that this practice is very costly in terms of both equity and efficiency. In general, both objectives lose. It's a zero-sum game.
- FONAM should be the action plan instrument, operating principally as a co-financing fund. In essence, it would co-finance taking advantage of interjurisdictional externalities and would look to encourage agreements between corporations and territorial entities to improve management of natural watershed basins.

8.2. Booz-Allen & Hamilton of Colombia Ltd., Institutional Strengthening of the Environmental Ministry. May 30, 1997. Bogotá. [NOTE: This is a confidential document and the property of MAVDT]

This report presents an evaluation of SINA with a focus on changes needed within the Ministry of Environment to help ensure that the system functions as intended. The report provides a diagnosis of major problems facing SINA related to MMA management and recommends a series of actions to correct them. The report's analysis of coordination within SINA predated the creation of a vice-ministry for SINA coordination. Some of the major problems identified and solutions suggested by the report include the following:

- SINA does not function as a system. Each component of the system operates independently without adequate coordination. Each CAR develops its own action plan based on a subjective interpretation of the National Environmental Plan and its own region's needs and desires.
- There is a need to develop indicators of the physical impact of environmental regulation and investment in natural resource management. Without these, it is not possible to evaluate the effectiveness of investment and regulatory programs.
- The system is fragmented because MMA does not exert adequate leadership. In part this is because MMA has not clarified its own priorities. This contributes to grossly inefficient and ill-targeted uses of resources by CARs in local projects.
- There are weak channels of communication between CARs, territorial governments, and MMA. Information from MMA is not adequately conveyed to the CARs, and CAR-level decisions are not fully conveyed to MMA.
- MMA's structure is a fundamental weakness. At the time of the report, MMA was organized around environmental themes, a structure that may not have best promoted the ministry's primary function as the central planner and coordinator of SINA. The report recommended creation of two vice-ministries within MMA, one for coordination of SINA and the other for policy and regulation. This recommendation was accepted and the reorganization was carried out in the late 1990s.

8.3. Galán S., Alberto, Consultant to National Department of Planning, Environmental Unit. 1998. "Rationalization of Spending in SINA: Institutional Firming towards Decentralization." Contract DNP-075-98, Final Report, Executive Summary. December. Bogotá.

8.3.1. Conclusions

- Given the uncertainty and fragility of the general decentralization tendencies, institutional reorganization that implies substantial adjustments of the central aspects of the system should not be undertaken.
- Efforts to create a sound fiscal basis for SINA activities should be intensified, with territorial government institutions taking increasing responsibility for implementation of environmental policy.
- The following aspects of institutional structure must be improved: ensure an active presence of environmental concerns (and representatives of environmental authorities) in the general institutional reform processes; disseminate studies, analyses, and evaluations of how environmental institutions affect other areas of management in SINA institutions.

8.3.2. Short- and medium-term actions

- Within a year, MMA and DNP should develop a work plan aimed at collecting a complete set of information on factors that affect their management.
- Environmental authorities should focus their efforts in a few work areas over a sufficient period of time to guarantee significant results.
- Investments and activities of central environmental authorities should focus on the following:
 - developing a technical foundation for land use and environmental planning;
 - regulatory development;
 - information systems; and
 - scientific research and investigations.
- Expenditures should be rationalized through the following actions:
 - evaluate factors that determine the effectiveness of spending at a regional level;
 - evaluate the effect of general institutional changes and general public investment on SINA organization, financing, and functions;

- use national fiscal resources more effectively to offset regional resource imbalances;
- increase integration of CARs' activities with planning objectives established by MMA; and
- systematically strengthen the departmental and municipal tax collection systems as a means of increasing the effective tax base for SINA institutions.

8.4. Ministry of Environment and Autonomous Regional Corporation of Valle del Cauca. 2002. The Voices of SINA: Reporting on the Sistema Nacional Ambiental. April. Bogotá.

The purpose of this report, produced by MMA and a major CAR (the CVC), was both educational and analytical. It was meant to provide a history of SINA's first nine years, an analysis of the strengths and weaknesses of the system, and priorities for the future. The report identifies the two major priorities for SINA as strengthening planning and improving the effectiveness of public participation.

8.4.1. Challenges in environmental planning

- Incorporate environmental concerns in the development process
 - Consolidate processes of adaptive environmental management, taking into account the complexity and uncertainty of the situation in Colombia, social and armed conflict, and economic globalization.
 - continue strengthening SINA's decentralization schemes, consolidating regional and local systems, and developing mechanisms for other government and economic sectors to be involved in environmental management. Shift the image of environmental management from "policing" toward one of self-management and self-control.
 - Transcend the jurisdictional and institutional limits in environmental management by encouraging social participation and interinstitutional and intersectoral coordination.
- Consolidate the Environmental Information System
 - Recognize that the Environmental Information System not only involves scientific-technical knowledge but is also a political process involving institutional actors with dissimilar interests and diverse views of what SINA is and should be.
 - Look for ways to transfer or replicate experiences of successful CARs.

- Monitor the use of technical and scientific information, particularly information generated by the institutes of investigation, in orienting policymaking in MMA and the CARs.
- Improve indicators, monitoring, and evaluation
 - Strengthen the design and implementation of quantitative and qualitative indicators of the state of the environment for use in monitoring, evaluation, and management at both the national and the regional levels.
 - Monitor the interinstitutional consultation undertaken to implement a basic system of indicators made up of (i) sustainability of Colombia's natural patrimony; (ii) sustainability of human activity; (iii) management of waste and emissions; and (iv) institutionalization of the sustainability.
 - Integrate use of monitoring and evaluation indicators into the planning process.
- Strengthen planning capacity in SINA's government institutions
 - Continue the process of short-, medium-, and long-run planning. Improve regulatory regimes and advance the social processes that commit SINA actors to create new approaches to development.
 - Monitor and evaluate integration of national environmental plans into CARs' 10- and 3-year environmental management plans.
- Structure long-run planning processes
 - Continue to strengthen the ability of SINA institutions to develop long-term plans that can overcome discontinuities in management inherent in the influence of electoral cycles on government administration. Understand planning as a means of resolving conflict and as political negotiation in which all affected actors feel involved as beneficiaries of economic and social outcomes.

8.4.2. Challenges of public participation

- Environmental authorities must tangibly demonstrate the political will to open up environmental management to public participation. This is the only way the public will regain confidence that participation is real and meaningful rather than merely formal and bureaucratic.
- Recognize that formal mechanisms of participation established by law may be inappropriate for use with indigenous communities.
- Identify legitimate representatives of social interests.

- Public participation must be based on complete, sufficient and comprehensible information.
- It is necessary to clarify the role of MMA and CARs, which many times serve as both judge and party to environmental conflicts with the public.
- MMA and CARs must motivate private and state industry to view environmental licenses as a management tool and not as simply a formal requirement or an obstacle that the state puts before them.
- Environmental authorities and institutes of investigation must guarantee access to all information needed for citizen oversight to function as an environmental management tool.
- Environmental authorities must maintain a presence and exercise control over their jurisdictions in zones of conflict. The victims of this conflict – many times members of environmental organizations – at the very least have a claim on the solidarity of public and civic actors in SINA.
- Environmental concerns are at the heart of the current armed territorial conflict. SINA institutions must give priority to documentation of the environmental impact of this conflict and to look ways to minimize it.
- SINA must be looked to as a space for nonviolent management of conflicts and learn from past experience in social movements for environmental protection.

8.5. Maria Gómez Torres. 2003. "Fiscal Policy for Environmental Management in Colombia." XV Seminario Regional de Política Fiscal, Comisión Económica para América Latina y el Caribe (CEPAL), Santiago de Chile. January.

This report focuses on the performance of mechanisms for funding environmental management in Colombia.

- National-level funding of environmental programs has proven procyclical. It has not been possible for the national government to maintain adequate national support of SINA institutions, CARs, or territorial governments for environmental and natural resource management during times of national fiscal crisis.
- In the past, MMA was able to direct local environmental investment by partially funding these efforts. This is increasingly difficult as the Environmental Compensation Fund has become less viable. This and general national-level fiscal instability has reduced the ability of MMA to use funding to orient CAR and AAU activities.
- IDEAM, the only research institute funded primarily by national public resources, has been seriously impaired by national fiscal instability. Other research institutes created by Law 99 have made great efforts to obtain research funds from independent sources. They should exploit this avenue

further. However, independent sources of research funding typically do not cover administrative costs of research organizations, and the rest of SINA risks losing influence over the research agendas of these institutions if they are forced to continue to rely principally on nongovernmental resources.

- The National Parks System has been unable to secure funding adequate to protect Colombia's parks. Instability in Colombian national governmental funding has led the National Parks System to seek international financial resources, but even these have been inadequate to cover normal operations of the system. The parks' ability to rely on service fees has been severely impaired by armed violence.
- Locally based funding sources, which depend on property taxes and environmental fees, present a very different picture. These sources grew 88.5% from 1995 to 2002. This funding base has strengthened the autonomy and stability of the CARs within SINA.
- Reliance on property tax has created very uneven distribution of resources across CARs. Eight CARs generate 74% of all locally levied taxes and fees in SINA. These are typically the CARs that existed prior to Law 99 and are areas with high population densities and intense economic activity. The other 25 CARs generate 24% of all locally levied taxes and fees in SINA. These are typically CARs that were formed by Law 99 and are often natural resource-rich areas with low population densities.
- The criteria for distribution of national resources to CARs should be revised. Too much of the national funding that is still provided to CARs goes to older, better-endowed CARs. This practice reflects the lack of clear criteria for distributing national funds to CARs, and because of that, national contributions to CARs' operating costs are based more on historical patterns and probably on the ability of CARs to negotiate. Priority should be given to finding ways to provide a minimum level of national fiscal aid to those CARs that cannot effectively raise their own revenues.
- Municipalities do not maintain separate accounts for expenditures on environmental projects or programs. As a result, it is not possible to evaluate the effectiveness of these expenditures. It is important to establish accounting practices that would allow such an evaluation.
- The complexity of implementing economic incentive instruments is limiting their use. Nevertheless, they hold significant potential to provide incentives for environmental improvement as well as revenue and therefore merit more effort.
- MMA and CARs must develop transparent indicators that allow evaluation of the effectiveness of environmental expenditures. Without these, it will grow increasingly difficult to argue for national funding for SINA.

8.6. Contraloría. 2003. "Report of the Government Audit with Integral Abbreviated Focus. Ministry of the Environment, Housing and Territorial Development. 2002." June. Bogotá.

8.6.1. Internal control

- The management work programs are deficient. They do not cover the ministry's mission processes, and they apply subjective oversight mechanisms. The indicators do not allow one to really define compliance with each area or process.
- Administration of information systems is not adequate, given that the ministry does not supply sufficient technical support. It risks of losing vital information for operations.
- The risks map is elaborated through oversight boards, which do not establish indicators of effectiveness and efficiency – they establish qualitative but not quantitative indicators.
- The ministry lacks management indicators that allow it to measure the extent to which it has achieved its mission; it has only a system of (subjective) compliance indicators, as is the case with the action plans.
- Although it is responsible for verifying and enforcing compliance with action plans, there is inadequate monitoring that covers all of the ministry's processes and areas, such as the assessment of risk management.
- Process and procedure manuals are inadequate. As a result, there is inadequate segregation of functions and processes that allow the definition of limits, scope, and mission. Because the development of functions is not based on process and procedure manuals, the ministry is not complying with Decree 1124 of 1999. Here, though, the ministry is moving forward with the first phase for achieving this goal.

8.6.2. Management weaknesses

- The ministry does not depend on action plans and does not use environmental indicators to evaluate and follow them up. It uses out-of-date policy documents and baselines. For example, in the solid waste implementation policy, formulated in 1997, low compliance (20%) with the policy's actions was observed for both the ministry and the regional environmental authorities. Regarding wastewater, CONPES 3177 was approved in July 2002, yet MAVDT hasn't developed the required waste water management plan.
- Regulation and implementation of Law 99 have been slow in such aspects as formulating the Ministry of Health's national population policy; evaluating

- economic consequences and effects of environmental factors; expediting and making current the zoning statute; and establishing methodologies for determining the value of economic costs, water use fees, and other fees.
- Regarding the Collective Environmental Project, there has been noncompliance with certain goals, such as the formulation and implementation of the Forestry Statute, the implementation of water use fees, and the implementation, consolidation, and operations of the Environmental Information System (SIAC). There is also evidence that resources have been assigned to certain strategic ecoregions, a result of a lack of technical criteria to allow for equity. Finally, the planning schemes demonstrate weaknesses, reflected in substantive modifications of the national development plan and its execution through different action plans.

9. Conclusions

This section is split into two parts. The first part describes 13 critical challenges that SINA faces. The second discusses 12 actions that can help SINA overcome these challenges.

9.1. Challenges

1. Inadequate regulations

As discussed in Section 6.1.7, although Colombia has extensive environmental regulations, they are inadequate for a number of reasons. First, in many cases, urgently needed regulation simply does not exist. Second, some regulations are incomplete and lacking critical details. For example, the *Contraloría* notes that a lack of regulations regarding the scope and applicability of public hearings has made the use of such hearings virtually incoherent. Third, some regulations are overly prescriptive and potentially inappropriate to local economic and social circumstances. For example, command-and-control emissions standards have sometimes been adopted from more developed countries with little modification.

These inadequacies in Colombia's regulations lead to many problems. They contribute to poor coordination between the Ministry of Environment (since 2003, *Ministerio del Ambiente, Vivienda y Desarrollo Territorial*, Ministry of Environment, Housing and Territorial Development, MAVDT) and CARs by making it difficult for CARs to carry out one of their basic functions – implementing regulations established at the national level. They also make it difficult for other institutions in SINA to perform their assigned roles. For example, in 2003, the *Contraloría* noted that lack of regulation – from constitutional precepts to specific information standards – makes it difficult to advance the Colombian System of Environmental Information. As discussed in Section 6.2.3, incomplete licensing and permitting regulations lead to inconsistent requirements and enforcement across CARs and therefore create opportunities for corruption. Lack of clarity of law and regulation also burdens Colombia's judicial system – a lack of clarity in Colombian environmental law (both statutes and regulations) may have contributed to the proliferation of *acciones de tutela* brought to protect the environment (see Section 6.8).

2. Limited environmental management capacity in some CARs and at MAVDT

As discussed in Section 6.2.2, environmental management capacity varies markedly across the CARs. For example, on average, only one-third of CAR staff are “professionals,” and 40% of CARs do not have functional environmental laboratories. Some of this heterogeneity is due to funding – almost three-quarters of the total revenue

generated by all 33 of Colombia's CARs accrues to just 8 of the CARs (see Section 4.1.3). As illustrated in Section 8, numerous past evaluations of SINA have suggested correcting such imbalances (e.g., Galán 1998; Gómez Torres 2003; Wiesner 1997). Given the autonomy and importance of CARs within SINA, this marked variability in regulatory capacity is a significant problem that has far-reaching consequences. It implies, for example, that environmental regulations are stringently enforced in some CARs and virtually ignored in others. It also implies that locally generated funds are efficiently collected and invested in some CARs but are scarce and inefficiently invested in others.

Inadequate human and technical capacity is an issue at MAVDT as well as at CARs. Previous evaluations of SINA have concluded that the Ministry of Environment requires better-trained and more technically qualified civil servants (see Sections 8.3 and 8.6). As discussed in Section 6.1.2, several stakeholders interviewed for this report stated that human capacity at the Ministry of Environment are particularly low at the present time due to cuts in staffing and political appointments. Recent environmental ministers have also been criticized for lacking in expertise in the environmental sector.

3. Regulatory capture and corruption

As detailed in Section 6.1.6, numerous studies have documented high levels of regulatory capture and corruption in the Colombian government, and evidence also suggests that regulatory capture and corruption are significant problems within SINA, at both the national and the regional levels. (We use the terms to refer to situations where interest groups exert undue influence on the activities of environmental authorities, so that instead of acting to further social welfare, the authorities act to further the interests of select groups. Corruption involves violation of laws – for example, bribery and intimidation – but regulatory capture does not.) At the national level, private-sector interests have far more influence on environmental policymaking than the organizations assigned responsibility for representing civil society – nongovernmental organizations (NGOs). As discussed in Section 6.9.1, national-level NGOs are relatively weak and have few meaningful avenues for participation, either formal or informal. The exact opposite is true of private-sector interest groups, however. For example, private-sector interests dominate the National Technical Advisory Council, a result of the composition of the council as laid out in Law 99 (see Section 3.2.5). In addition, since the mid-1990s, MAVDT has promulgated dozens of voluntary agreements with private industry. As discussed in Section 6.1.8, these agreements often serve to perpetuate and legitimize noncompliance by industry.

As discussed in Section 6.2.1, regulatory capture and corruption are also serious issues at the regional level. Private-sector interest groups have a strong influence on CAR decisionmaking. Members of boards of directors with strong ties to the private sector

include not only two dedicated private-sector representatives, but often mayors and even NGO representatives, who sometimes represent spurious local organizations set up by, or closely tied to, industry. Private-sector influence aside, CAR decisionmaking is often unduly influenced by political considerations. For example, environmental investments such as reforestation are sometimes spatially targeted to maximize political payoffs instead of environmental benefits.

4. Inadequate enforcement

As discussed in Section 6.2.4, a wide variety of environmental regulations in Colombia are not consistently enforced. For example, of the effluent fees that CARs charge to polluters, only one-third are actually collected (Gómez Torres 2003, 40). Enforcement varies markedly across CARs, across sectors, and across sizes and types of firms. Contributing factors include a lack of political will and inadequate access to police assistance, as well as several of the problems discussed in Sections 6.1 and 6.2—regulatory capture, low levels of human and technical capacity, poor information systems, reliance on voluntary regulation, and inadequate regulations.

5. Reliance on voluntary regulation

As discussed in Section 6.1.8, the Ministry of Environment's reliance upon voluntary clean-production agreements and voluntary environmental guides has raised serious concerns. Many voluntary clean-production agreements appear to have simply legitimized and perpetuated noncompliance with existing command-and-control regulations. The legal standing and purpose of environmental guides is not clear. In particular, confusion exists in the regulated community about whether compliance with voluntary environmental guides is a substitute for compliance with actual regulations. Also, the guides promote abatement strategies that are not always the most appropriate.

6. Lack of coordination between MAVDT and CARs

Law 99 assigned the Ministry of Environment the role of leading SINA and, in particular, of overseeing and coordinating the activities of CARs. A basic element of sound management, national-regional coordination is important for ensuring that CARs address environmental problems deemed of highest priority to Colombia, minimizing discrepancies in the enforcement and implementation, and taking advantage of economies of scale in policy and program implementation and in investment. As discussed in Section 6.1.3, unfortunately, considerable evidence—including major evaluations of SINA—suggests that the ministry's performance in this area has been inadequate (see Sections 8.1 and 8.3).

Poor coordination between MAVDT and CARs stems in part from contradictions in the design of SINA as established in Law 93. As discussed in Section 3.2, CARs have a great

deal of autonomy. For example, the lion's share of their funding comes from internal sources – property taxes levied by municipalities, taxes on energy generation and petroleum extraction, and effluent fees – and they have a great deal of control over how these funds are spent. As discussed in Section 7 and Appendix B, other countries with decentralized environmental management systems face the same problem of coordinating national and regional authorities. Indeed, such tensions seem to be inherent in decentralized systems.

As discussed in Sections 3.2, 3.3, and 6.2, national authorities in Colombia have a variety of mechanisms at their disposal to ensure CARs act in accordance with national policies. First, CARs are required to submit 10-year, 3-year, and 1-year action plans that tie in with the national development plans drafted by the executive branch. Second, the National Department of Planning must approve CAR investment projects. Third, CARs boards of directors include a representative of the Ministry of Environment, as well as a representative of the president of Colombia. Fourth, Colombia's control organizations can discipline CARs for failure to implement plans or for abuse of office. Fifth, national authorities have some control over the salaries of CAR staff. Finally, in the past, the Ministry of Environment and other national institutions have contributed investment funds – or have allocated funds contributed by multilateral institutions – and this power of the purse has given them some sway over CAR investment projects. Similar mechanisms are used to coordinate EPA-state relationships in the United States (see Appendix B.4.)

Several factors limit the effectiveness of these mechanisms, however. As discussed in Section 5, the Ministry of Environment has very poor information about the investment, policy implementation, and regulatory enforcement activities of CARs. In addition, as discussed in Section 6.7, levels of staffing in the national office of the Delegate *Procuraduría* for Environmental Affairs are not adequate to monitor or evaluate the performance of CARs, and the *Contaduría* is severely hampered by lack of data. As for regulations that mandate intensive planning at the regional level, as discussed in Section 3.3.3, previous evaluations have concluded that even when CARs do fulfill their planning requirements, they often follow only the letter of the law, rather than actually orient resource management. Finally, as discussed in Section 4, the current fiscal situation and a decline in multilateral funding severely constrains MAVDT's ability to cofinance investment.

7. Inadequate data on environmental quality and institutional performance

As discussed in Sections 5.2, 6.2.2, and 8, there is general recognition in Colombia that (i) a well-managed and well-functioning system for collecting and disseminating data on environmental quality and institutional performance is indispensable for environmental management, and (ii) Colombia's current system is inadequate. Many of

our interviewees – from both inside and outside the government – cited lack of such a system as a critical contributor to SINA's failings.

Efforts to develop a consistent system of indicators and improve management of the Environmental Information System are underway at the national level and at the CAR level. However, similar past efforts have yielded little, and there little reason to be optimistic that present efforts will turn out differently. Moreover, even were there agreement on indicators, Colombia would need to make substantial progress to implement them, given SINA's limited capacity for data collection. As discussed in Section 5.2, Colombia's data collection infrastructure – including environmental laboratories, measuring stations, documentation centers, and basic cartography – is clearly inadequate. For example, 40% of the country's CARs either have no environmental laboratories or have laboratories that do not function at a minimal level.

8. Lack of priority setting across environmental subsectors and programs

As discussed in Section 6.4.4, SINA lacks a systematic mechanism for priority setting across environmental programs and subsectors, such as forestry, air pollution, water resources, and water sanitation. Planning is generally done sector by sector, and efforts to break out of "sectoral boxes" to consider prioritization across programs or sectors have not been successful. This problem, common to environmental regulatory systems around the world, arises in part because day-to-day work in most regulatory systems is organized by environmental media or problem areas, such as forestry, water, or air.

Lack of cross-sectoral planning contributes to imbalances in budgetary priorities: budgetary allocations are apparently driven more by institutional history than by environmental needs. For example, a recent audit of the Ministry of Environment found that rural environmental issues accounted for three-quarters of the ministry's investment budget, even though more than 70% of Colombia's population is urban.

Priority setting across subsectors and programs would, of course, be greatly enhanced by improvements in data collection and environmental indicators. Even given current information sources, however, greater attention to setting priorities across environmental subsectors would help improve the effectiveness of environmental management in Colombia.

9. Inadequate mechanisms for public participation

As discussed in Section 3, Colombia's 1991 Constitution and Law 99 create numerous mechanisms for public participation in both formulating and implementing and environmental policy. The primary mechanism for promoting participation in policy formulation is to ensure that NGO representatives serve on the boards and councils of advisory bodies, both at the national and the CAR level. As discussed in Section 6.9.1,

this NGO-focused approach to ensuring public participation in policy formulation has yielded decidedly mixed results, in large part because Colombia's NGOs are still relatively weak and are provided few real opportunities for effective participation, at both the national and the regional level.

After the creation of ECOFONDO—now the main source of funding for environmental NGOs in Colombia—many important national-level NGOs withered and eventually disappeared. Many of the formal avenues for NGO participation, such as representation on the National Environmental Council, appear to be a mere formality. Historically, NGOs have depended largely on informal participation mechanisms, such as personal relationships with people inside MMA. But interview evidence suggests such informal information flows have diminished significantly in recent years.

NGO participation at the CAR level is widely considered particularly problematic. The representation of NGOs on CAR boards of directors is associated with cronyism—spurious NGOs are often created by local political and business interests to fill seats on CAR boards. NGOs working at the local level, particularly in rural areas, also confront problems both from lack of security and from a perception by the government that they are sympathetic to terrorists or are themselves subversive organizations. The continuing limitations of Colombia's NGO-focused approach to public participation in Colombia beg the question whether it is likely to be the most effective tactic.

Another important mechanism for ensuring participation is to make information about environmental issues more widely available. One means of doing this is to require early notification of the government's intention to make important policy changes. Colombia does not currently have a consistent system of prior notification of the government's intention to take many major actions, such as promulgation of major regulations. Nor is there systematic provision for public comment.

As discussed in Section 3, under Law 99, one mechanism for promoting public participation in the implementation of environmental policies is to allow interventions in licensing actions and public hearings over licenses. In this case, it is not the formal mechanism so much as its implementation that has failed. As discussed in Section 6.9.1, the use of hearings varies widely across CARs. Between 1998 and 2002, 40% of CARs did not hold any public hearings. Also, different CARs have a different notions of how the hearings are to be used, and this has contributed to corruption.

10. Poor coordination between the institutes of investigation and other SINA entities

As discussed in Section 6.5.1, coordination between the institutes of investigation and other SINA entities is poor. A particular problem is lack of coordination with MAVDT and especially the Institute of Hydrology, Meteorology and Environmental Studies

(*Instituto de Hidrología, Meteorología y Estudios Ambientales, IDEAM*), which is responsible for managing environmental data in Colombia. Specifically, the institutes of investigation other than IDEAM tend to specialize in research that is academic and not especially relevant to policymaking. A number of factors contribute to this coordination problem. One is poor MAVDT leadership. Under Law 99, the Ministry of Environment is responsible for articulating SINA research priorities and, therefore, for informing agendas of the institutes of investigation. All available evidence suggests that SINA performs this function poorly, in part because no provision has been made in recent MAVDT budgets to provide staff time to consider research priorities, or to communicate those priorities to the institutes or other researchers. Second, MAVDT lacks capacity to make use of high-quality, policy-relevant research when it is produced. This is partly the fault of the research institutes, which could do a better job of making their research results “user-friendly.” Third, researchers at the institutes of investigation have different time lines than do policymakers. Scientific researchers inevitably tend to focus on long-term problems like biodiversity loss. Policymakers, by contrast, tend to focus on short-term issues, which change with each administration. Finally, national funding for the research institutes has declined, and as a result the institutes have had to rely on international funders whose priorities often are not aligned with those of SINA.

11. Potential adverse impacts from the merger of the Environment and Economic Development ministries

It is still much too early to gauge the impact of the merger of the Ministries of Environment and Economic Development. As discussed in Section 6.1.4, the merger may have both positive and negative impacts. On the positive side, it could help correct a longstanding bias in the Ministry of Environment in favor of “green” environmental issues (such as forestry and biodiversity) at the expense of urban environmental issues (such as air pollution and water pollution); facilitate better coordination of the siting, licensing, and permitting of major water, sewage, and hazardous waste treatment facilities; mitigate the Ministry of Environment’s tendency to ignore the costs of environmental regulation; and help mainstream environmental concerns.

On the negative side, however, as discussed in Section 6.1.4, the merger has the potential to seriously impair the Ministry of Environment’s ability to play the role of SINA’s “rector,” as assigned to it by Law 99 (as well as subsequent legislation and practice). The merger could thus seriously weaken SINA by lowering the ministry’s profile – and potentially its influence. In addition, the merger has the potential to impair the ministry’s ability to carry out its permitting and licensing functions for national-scale investment projects, such as large-scale drinking water and sanitation projects (for a definition of such projects see Law 99 of 1993 Art. 52). It could have this effect by creating conflicts of interest between national authorities charged with promoting such

investment projects and those charged with licensing and permitting them. Both sets of authorities are now housed within MAVDT. As noted in Section 6.1.4, several high-profile members of the environmental community have voiced extremely pessimistic views on the merger.

12. Potential conflicts of interest in the structure of Urban Environmental Authorities

Colombia's CARs are more or less financially self-sufficient, an arrangement intended to insulate them from regulatory capture by local interest groups. However, funding for Colombia's four Urban Environmental Authorities (*Autoridad Ambiental Urbana*, AAU) is now channeled principally through municipal governments.

As discussed in Section 4.2.3, prior to 1998, AAUs received financial resources from three main sources: self-generated revenue raised through the mechanisms established under Law 99 (principally property taxes); transfers from municipalities; and national contributions, including substantial credits from the World Bank for capacity building. Property tax revenues and the World Bank credits were the largest funding sources. After 1998, however, these two critical sources of funding were cut drastically. The Constitutional Court declared unconstitutional Article 9 of Decree 1339 of 1994, which had granted AAUs half of the property taxes raised by municipalities. Also, after 2000, the AAUs stopped receiving national funds.

Thus, AAUs now depend mainly on municipalities for financing. These same municipalities sponsor some of the important investment projects that AAUs must regulate. In addition, AAU directors general are appointed by the mayors of the cities that the AAU serves. These arrangements have the potential to create conflicts of interest.

13. Low public-sector spending on SINA

As discussed in Section 4.1.1, total public-sector spending on SINA is relatively low. The World Bank recommends that developing countries spend between 1.4% and 2.5% of gross domestic product (GDP) on the environment. In Colombia, total public-sector spending on the environment – including spending by CARs, the Ministry of Environment, and research institutes – averaged just 0.38% of GDP between 1995 and 2002, rising from 0.34% in 1995 to 0.37% in 2000.

The level of funding for the environment in Colombia may be less important than the efficiency with which funds are spent. For example, are funds being devoted to uses that have the greatest net benefits? Are funds being wasted because financial controls are lax? As discussed elsewhere in this report, considerable data suggest that the answer to these questions is frequently no.

9.2. Recommendations

This section describes 12 actions Colombia can take to meet the 13 challenges discussed above. Most of these actions address more than one of the 12 challenges. Therefore, for the sake of clarity, after each recommended action, we list the challenges the action is meant to address.

1. Initiate a long-term program to review and rationalize regulations.

MAVDT should commission an independent study, or use existing studies, to identify and prioritize problems with regulations of environmental statutes, including gaps, inconsistencies, inappropriate levels of specificity, and technical requirements that are not appropriate to current local conditions in Colombia. The results of this analytical effort can be used to initiate a long-term program of rationalizing and reforming regulations.

Challenges addressed:

1. Inadequate regulations
3. Regulatory capture and corruption
4. Inadequate enforcement
5. Reliance on voluntary regulation
6. Lack of coordination between MAVDT and CARs

2. Evaluate and rationalize voluntary regulation.

There is little evidence to indicate that national-level voluntary clean-production agreements have promoted compliance with existing regulation or even that they have improved environmental performance. This conclusion comports with international experiences with voluntary regulatory compacts, in both industrialized and developing countries. Hence, further efforts to promote clean-production agreements in lieu of mandatory regulation should be undertaken cautiously, if at all. At a minimum, any future voluntary agreements should shift the burden of proof to polluting firms by establishing clear periodic performance milestones (focusing on easily monitored activities) that would need to be met for the agreement to continue in force.

The argument for continued reliance on voluntary environmental guides is stronger. These guides appear to fill a need for user-friendly official guidance on how firms and farms can improve their environmental performance and how they can comply with regulations, which, as discussed above, are often incomplete and unclear. That said, the guides themselves have created considerable confusion. For this reason, efforts should be undertaken to modify them and to clarify the role they play within SINA. In general, the guides should be rewritten to ensure consistency with the existing command-and-control regulations. This effort should complement any effort undertaken to rationalize

regulations. In addition, the legal status and implications of the guides should be clarified.

Challenges addressed:

1. Inadequate regulations
3. Regulatory capture and corruption
4. Inadequate enforcement
5. Reliance on voluntary regulation

3. Improve the collection, management, dissemination, and use of environmental data.

SINA's data management system can be enhanced in a number of ways. First, MAVDT can move quickly to develop clear, transparent, consistent indicators – of both environmental quality and institutional performance – that are feasible given the data collection and management capacity expected to prevail in Colombia in the medium term. Second, MAVDT should incorporate these indicators into the planning process that requires CARs to formulate and disseminate 1-year, 3-year, and 10-year environmental plans. Such indicators can be used to help CARs develop these plans and also help both CARs and national-level policymakers evaluate implementation efforts. Third, MAVDT should act to clarify the regulatory underpinnings of the Environmental Information System and improve its general management. Finally, MAVDT should work with CARs to improve data collection infrastructure and information management systems at the local level.

Challenges addressed:

1. Inadequate regulations
3. Regulatory capture and corruption
4. Inadequate enforcement
6. Lack of coordination between MAVDT and CARs
7. Inadequate data on environmental quality and institutional performance
8. Lack of priority setting across environmental subsectors and programs
9. Inadequate mechanisms for public participation
10. Poor coordination between research institutes and environmental regulators

4. Seek opportunities to strengthen the environmental NGO sector and build its political constituency.

The executive branch can help to strengthen the NGO sector in a number of ways. First, the Ministries of Environment and Education can promote environmental education by, for example, strengthening curricula that incorporate environmental subject matter and funding programs to train teachers in environmental sciences. Second, the Ministry of Environment, the research institutes, and the National Administrative Statistics Department (*Departamento Administrativo Nacional de Estadística, DANE*) can ensure the

free availability of environmental data collected by SINA institutions, including facility-level and ambient monitoring data, and indicators of institutional performance. Third, the executive branch can ensure that NGOs are adequately represented both in formal deliberative bodies, such as the National Environmental Council, and in informal deliberations. Fourth, the executive branch can adopt reforms suggested below regarding enhancement of notice and comment mechanisms. Finally, the Ministry of Environment, the Colombian International Cooperation Agency (*Agencia Colombiana de Cooperación Internacional, ACCI*), and the Ministry of Foreign Affairs can encourage collaboration between Colombian and foreign NGOs with an eye toward improving domestic capacity. The goal is to help Colombian NGOs build strong, geographically and socially diverse constituencies and improve the ability of these constituencies to participate in the democratic process. Ultimately, it will likely be political strength that assures the public a strong voice in environmental policymaking.

Challenges addressed:

3. Regulatory capture and corruption
4. Inadequate enforcement
9. Inadequate mechanisms for public participation

5. Strengthen advance notice of significant environmental policy actions and provide opportunities for public input.

Public participation in policymaking requires that the public be informed when new policies are being considered, be provided with opportunities to comment on proposed new policies, and have their comments taken seriously. Public participation in environmental policymaking in Colombia could be strengthened by establishing formal procedures for facilitating such input at all levels of government. This would entail (i) establishing clear procedures and mandates for early notification of national and regional regulatory agencies' intent to draft new regulations or make major changes in policy (for example, requiring that drafts of proposed regulations be published in the *Diario Legal* and/or on publicly accessible Web sites) and for public comment on these notices; (ii) building capacity for public comment in economic sectors with significant environmental impacts; and (iii) establishing requirements and developing the internal agency capacity to take comments into consideration in writing regulations and making policy, and to report back to the public on exactly how public comments were taken into consideration.

Challenges addressed:

3. Regulatory capture and corruption
4. Inadequate enforcement
9. Inadequate mechanisms for public participation

6. Establish a mechanism for setting priorities across environmental subsectors.

Although recent reforms may help address previously recognized problems in coordinating environmental planning between national and regional levels of government, there remains a need to coordinate planning across substantive areas of environmental policy, such as forestry and urban air pollution. Therefore, in its regular national planning, MAVDT should include a process of priority setting across environmental subsectors.

We recognize that Colombia's regional diversity implies that CARs may set very different goals and may use very different strategies to achieve them. Nevertheless, for the reasons discussed above, a regular priority-setting mechanism that accommodates this diversity – and the consequent need for policy flexibility – is likely to generate considerable benefits by helping to rationalize and coordinate environmental protection activities across subsectors, regions, administrative levels, and institutions. To promote legitimacy and “buy-in,” a participatory, transparent process should be used to set priorities.

One option is for MAVDT to require that each CAR periodically perform an assessment of the relative importance of various risks to human health and the environment in its jurisdiction. Furthermore, MAVDT can require that CARs use this comparative risk assessment to guide its allocation of financial, human, and technical resources. This recommendation is fleshed out in Blackman et al. (2004).

Challenges addressed:

6. Lack of coordination between MAVDT and CARs
8. Lack of priority setting across environmental subsectors and programs
10. Poor coordination between research institutes and environmental regulators

7. Explore strategies for improving coordination between MAVDT and CARs and building management capacity in CARs.

MAVDT should aggressively explore new strategies for improving coordination between itself and CARs and building management capacity in CARs. A necessary condition is a system for collecting credible data on the institutional performance of CARs (the topic of a separate recommendation). These data are needed for planning coordinated activities, monitoring compliance with such plans, and monitoring overall institutional performance. Actively disseminating such data – or even just publicly disclosing it – can create strong incentives for compliance with coordinated plans and for improved institutional performance.

Additional (potentially complementary) mechanisms are available. One is to strengthen the capacity and authority of SINA's control organizations, which in theory are responsible for ensuring that CAR activities comport with the law.

Another option is to hold an annual meeting of MAVDT and CAR representatives that is fully open to the public. The meeting would have a number of aims: to improve CAR-MAVDT coordination; to disseminate best practices among CARs and raise average levels of regulatory capacity; and to increase transparency and information sharing. In addition, the meeting would enable CARs to publicly report on their activities and would thereby create incentives for improved institutional performance.

Still another option would be to enhance MAVDT's ability to co-finance investment projects at the regional level. As discussed in Section 7 and Appendix B, in countries with a decentralized environmental structure, co-financing is often the most important tool national authorities have to ensure national-regional coordination. One disadvantage of this approach is that it would be less effective in CARs that have sufficient self-generated funds.

National environmental funds are likely the most efficient and transparent means of enhancing co-financing. MAVDT could rely upon existing mechanisms – the National Royalty Fund, the Environmental Compensation Fund, the National Environmental Fund (*Fondo Nacional Ambiental*, FONAM), and the National Fund for Environmental Action. However, as discussed in Section 4.3.2, these funds have significant structural characteristics that render them less than ideal for the purpose at hand: each fund alone probably has resources that might not be sufficient to have the desired impact; several of the funds have goals other than coordinating national-regional environmental management and/or entail legal restrictions that would limit MAVDT's discretion in deciding how and where to disburse funds; some of the funds have been plagued by poor management; and some have limited resources outside national appropriations. Given these constraints, MAVDT might consider consolidating and restructuring the existing funds, or creating a new fund.

Ideally, the fund – whether a modification of an existing mechanism or a new one – would have the following features: CARs would submit proposals for co-financing to MAVDT, and MAVDT would evaluate and select proposals using clear and transparent criteria. In establishing these criteria, MAVDT's broad aim would be to maximize net benefits (benefits to human health and the environment net of total costs) but also to further national-regional coordination and reduce disparities across CARs in both regulatory capacity and access to environmental services. Thus, the proposal selection criteria would include such factors as the degree to which the project comports with national and regional environmental plans; the capacity of the particular CAR to implement the project; the level of environmental infrastructure in the particular CAR relative to other CARs; the need for capacity building in the particular CAR relative to other CARs; and the magnitude of the potential net benefits to human health and the environment from the proposed projects.

Conventional mechanisms would be used to ensure that project funds are well spent. First, to ensure that CARs are fully committed to the project, they would be required to supply a significant percentage of capital from their own coffers. Second, CARs would be required to collect clear, transparent baseline data, establish performance milestones based on specific monitorable criteria, and provide periodic progress reports on the extent to which these milestones have been met. Finally, clear failure to meet milestones would disqualify CARs from future co-financing. Note that these mechanisms would help bolster MAVDT's ability to monitor CAR activities.

Challenges addressed:

2. Limited environmental management capacity in some CARs and at MAVDT
3. Regulatory capture and corruption
6. Lack of coordination between MAVDT and CARs
7. Inadequate data on environmental quality and institutional performance

8. Establish national professional standards for key positions in CARs.

MAVDT should establish national minimum professional standards for top positions in CARs. Individual CARs would be allowed to establish stricter standards, but not weaker ones. In the case of the director general, MAVDT could reassess existing national standards established under Decree 1768/1994 (Article 21). The principal aim of this effort would be to ensure that key CAR staff possess the technical qualifications needed to perform their jobs effectively, and to discourage hiring and promotion based on purely political criteria. The professional standards should allow for different qualifications in different CARs, given their regional diversity. Independent third parties, such as universities and professional associations, should be responsible for assessing the extent to which candidates meet national standards. Even if the standards are not legally binding, a voluntary system of evaluation and public disclosure could have a positive impact and serve as a first step toward a more comprehensive system.

Challenges addressed:

2. Limited environmental management capacity in some CARs and at MAVDT
3. Regulatory capture and corruption

9. Recognize that attempting to improve the functioning of CARs through minor modifications in institutional design may have only minor impacts.

Leaving aside the question whether changes to Law 99 designed to improve the functioning of CARs and coordination between the MAVDT and CARs are advisable, the Uribe administration's recent experience with reforms suggests that – barring any dramatic changes in the political landscape – only relatively minor changes will be politically possible for some time to come. In our view, such minor reforms are not

likely to have significant impacts largely because the root causes of the problems such reforms seek to address are complex. Major factors contributing to the poor functioning of some CARs include social instability, poverty, systemic corruption, and weak institutions – in virtually every sector, not just the environmental sector.

Challenges addressed:

2. Limited environmental management capacity in some CARs and at MAVDT
6. Lack of coordination between MAVDT and CARs

10. Develop an agenda for Colombia's five research institutes and commission a study of their effectiveness.

MAVDT should periodically draft and disseminate an agenda for Colombia's research institutes to ensure that national policymakers assess, prioritize, and communicate their research needs. MAVDT should recognize that publication of this agenda alone will not solve problems of coordination between the institutes and policymakers, since the institutes will still require funding to pursue the agenda MAVDT drafts. This funding need not come from MAVDT exclusively. Indeed, the agenda by itself may help the research institutes raise outside funding for relevant research. However, outside funding is not likely to be sufficient. Therefore, MAVDT should investigate opportunities for funding research relevant to its agenda. One option would be to establish a competitive research grants process focused on national research priority areas, the funding for which could come partly from foreign sources.

MAVDT should also commission a study of the effectiveness of the current configuration of four independent research-oriented institutes of investigation (not including IDEAM). The study should consider the advisability of reducing the number of research institutes by consolidation or elimination.

Issues addressed:

10. Poor coordination between research institutes and environmental regulators

11. Investigate opportunities for enhancing the Urban Environmental Authorities' political and financial autonomy.

To avoid conflicts of interest, options should be investigated to limit municipalities' control over AAU funding and over the appointment of AAU top management. Such options include allocating to AAUs a dedicated percentage of certain municipal tax revenues.

Challenges addressed:

3. Regulatory capture and corruption
12. Potential conflicts of interest in the structure of AAUs

12. Appoint an independent commission to evaluate the effects of the merger of Environment and Economic Development Ministries.

Appoint an independent, nonpartisan commission to evaluate the impacts of the merger on MAVDT's ability to play its role as SINA's "rector" and to regulate the provision of national-scale infrastructure (for a definition of such projects, see Law 99 of 1993 Art. 52). We recommend that the commission be appointed promptly and issue an interim report within 12 months of being appointed, and a final report within 24 months. The naming of the commission, its methodology, and its reporting should be transparent, and the commission's report should be made fully available to the public.

Ideally, the commission would serve a dual function. First, it would provide the data policymakers need to assess the impacts of the merger of the ministries and to take any remedial action needed. Second, it would create incentives for national policymakers to be proactive in minimizing potential damages from the merger. For example, some of our interviewees argued that the degree to which the merger damages SINA will depend largely on the selection of MAVDT ministers and their performance, particularly the extent to which they focus on environmental issues as opposed to housing and economic development. The existence of the commission, and the knowledge that it will issue a public report, may create incentives for the president to appoint MAVDT ministers with strong environmental credentials, and for those ministers to focus on environmental issues.

We would note that an argument exists for appointing a commission to investigate the impact of national restructuring of the environmental sector, even if no commissions are created to investigate the impacts on other sectors. Unlike the constituencies of other ministries, the constituency of the Ministry of Environment – the public at large – is diffuse, disorganized, and underrepresented by lobbying organizations.

Challenges addressed:

- 2. Limited environmental management capacity in some CARs and at MAVDT
- 3. Regulatory capture and corruption
- 7. Inadequate data on environmental quality and institutional performance
- 11. Potential adverse impacts from the merger of the Environment and Economic Development ministries

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Appendix A. RFF Stakeholder Interviews, December 4–12, 2003

December 4, 2003

Carlos Costa, Director of Environmental Policy, National Planning Department (DNP)
Juan Pablo Bonilla, Vice Minister of Environment, Ministry of Environment, Housing
and Territorial Development (MAVDT)

Pedro A. Chavarro, Office of the Vice-Minister of Environment, MAVDT

Santiago Villegas, Director of Planning, MAVDT

Mauricio Rivera, Office of Potable Water and Basic Sanitation, MAVDT

Marcela Bonilla, Office of Sustainable Development, MAVDT

December 5, 2003

Claudia Arias, Office of General Secretary, MAVDT

Juan Carlos Riascos, Director, National Parks Unit

Diana Gaviria, National Parks Unit

Andrés Guerrero, National Parks Unit

Fernando Gast, Director, Alexander von Humboldt Institute

Carlos Costa, Director of Environmental Policy, DNP

Luz Marina Arévalo, Subdirector of Planning and Regulation, DNP

Jhon Berajano, Environmental Unit, DNP

Elisa Moreno, Coordinating Office for State Reform, DNP

December 9, 2003

Eduardo Uribe, Program Director, Environmental Economics, Universidad de los
Andes.

Sergio Barrera, Professor, School of Engineering, Universidad de los Andes.

Gloria Sanclemente, Director of the Legal Office, MAVDT

December 10, 2003

Gerardo Viña, Consultant, Former Director, Environmental Sector, MAVDT

Fabio Arjona Hincapié, Director, Conservation International Colombia, and Former
Vice-Minister, Ministry of Environment (MMA)

Rafael Colmenares, Executive Director, ECOFONDO

Julio Cesar del Valle, Secretary, Asociación Nacional de Empresas de Servicios Públicos
Domiciliarios y Actividades Complementarias e Inherentes (ANDESCO)

Mauricio López, Technical Secretary, ANDESCO.

Carlos Herrera, Manager for Environmental Affairs, Asociación Nacional de Empresas
de Colombia (ANDI)

December 11, 2003

Julio Carrizosa Umaña, Professor, Universidad Nacional, and Former Director,
INDERENA

Elsa M. Escobar, Director, Fundación Natura.

Álvaro Villate Supelano, Contralor Delegate for Environment, Contraloría

Ricardo Botero Villegas, Director, Sectoral Studies, Contraloría

Ernesto Guhl Nanetti, Consultant, Former Vice-Minister, MMA

Manuel Rodríguez Becerra, Former Minister, MMA

December 12, 2003

Adriana María Guillén, Environmental and Agrarian Issues, Procuraduría

Claudia Sampetro, Attorney and Professor, Universidad Externado

Carlos Rodríguez, Director, Tropenbos International, Colombia

Leonardo Muñoz, Acting Director, CRA

Appendix B. Environmental Decentralization in the United States

Seeking the Proper Balance between National and State Authority²¹

As discussed in the body of this report, one of SINA's critical challenges is coordinating the activities of MAVDT and CARs. This challenge reflects tensions inherent in systems of decentralized environmental management: all countries with such systems must establish institutions and procedures to effectively coordinate the activities of national and regional regulatory authorities. To shed light on alternative approaches to the challenges SINA faces, this appendix examines the United States' experience with environmental decentralization. It describes relationship between the U.S.

Environmental Protection Agency (EPA) and the states. It outlines the factors that are considered in determining the appropriate degree of decentralization, the advantages and disadvantages of decentralization, how the EPA-state relationship has evolved over the years, and the structural mechanisms used to ensure that there is a high degree of performance by EPA and the states in administering the programs. Program-specific examples of the EPA-state relationship are also provided.

B.1. Background

B.1.1. Environmental protection roles at various levels of government

In the United States, environmental laws are enacted and environmental programs are managed at all levels of government: federal (i.e., national), state, and local. The laws pertaining to many major environmental problems – for example, clean air, clean water, and management of hazardous waste – are typically passed at the national level. The states then pass laws that are consistent with the national laws. Sometimes these state laws are designed to address state-specific environmental problems.

EPA is the federal entity responsible for administering many of the national environmental laws. Examples of EPA's mandates include the regulation of air, water, hazardous waste, pesticides, toxins, pollutants, and the protection of wetlands.

Many other federal agencies also have responsibilities for environmental programs. For example, federal legislation directs the U.S. Fish and Wildlife Service to protect specific natural resources, requires those who wish to dredge streams to obtain a permit from the U.S. Army Corps of Engineers, and mandates that the U.S. Department of Transportation consider the environmental impacts of the highways that they construct.

²¹ The authors acknowledge the assistance of Stanley Laskowski in preparing this appendix.

In addition to the programs mandated by legislation, presidential executive orders direct federal agencies to take specific actions that relate to the environment. For example, a recent executive order requires that environmental management systems be developed for all major federal facilities. This appendix focuses on the laws that EPA administers and their relationship with the states in implementing these laws.

The environmental protection roles assigned to the various levels of government in the United States reflect not only the constitutional division of responsibilities between the national and state governments, but also a logical allocation of responsibilities. For example, most environmental research is directed at the national level by the EPA's Office of Research and Development and supported by academic institutions and private researchers throughout the country. It makes much more sense to centralize research on many issues (e.g., climate change, impacts of lead pollution) at the national level rather than to have each state do its own research on these topics. Conversely, an environmental permit for a specific facility is usually better negotiated by a level of government closer to the facility. These local government officials have a much better understanding of the local environmental situation, the stakeholders involved (e.g., NGOs), and cultural or economic considerations.

Other factors influence the allocation of responsibility for the administration of environmental programs in the United States. One such factor is the degree of expertise and sophistication of environmental professionals at the various levels of government. From the late 1960s through the early 1980s, when initial versions of many of the major U.S. environmental laws were being passed, environmental programs were generally more centralized at the national level than they are today. For example, EPA issued more permits and conducted more inspections than it does currently. One reason for this centralization is that there were then more highly trained environmental professionals at EPA than in the state agencies. Another reason was a natural tendency to assert centralized control while regulations were being developed, national standards were being established, and national environmental policies were being debated.

However, not all legislation had the same degree of centralization. For example, in passing the Clean Air Act of 1970, Congress assumed that the states would immediately have "primacy" and would be responsible for the development of the state implementation plans (SIPs) that established the controls needed to meet air quality standards. EPA's role under the Clean Air Act was to give technical assistance in the development of these plans and to formally approve the SIP after it was officially submitted by the state to EPA.

Contrast the Clean Air Act approach with the legislation for the Federal Water Pollution Control Act (FWPCA) of 1972. FWPCA established the national program for regulating point sources of water pollution – the National Pollutant Discharge Elimination System,

or NPDES. The NPDES program required that a state be officially “delegated” the program based on having demonstrated that it met certain requirements, such as having laws or regulations with adequate levels of penalties for noncompliance, and employing a sufficient number of properly trained environmental professionals to write the permits, perform the inspections, and take appropriate enforcement actions. Thus, during the early stages of the NPDES program in the 1970s, EPA issued many of the initial permits and enforced these permits. Many states passed the needed laws and hired staff as quickly as their processes would allow, and by the early to mid-1980s a majority of the states were officially delegated the NPDES program. EPA then assumed an “oversight” role, which will be addressed in more detail below.

In addition to the Clean Air Act, which gave the states “primacy” from the beginning, and the NPDES program, which was “delegated” to the states only after they had met certain conditions, there is a third category of programs – those that by law are implemented by EPA. An example of this approach is the PCB program under the Toxics Substances Control Act.

To complete the picture of the various approaches to decentralization of responsibilities in the United States, there are also hybrid programs that allow for various combinations of approaches. The Superfund program is one example. This program is designed to remediate abandoned hazardous waste sites. When the program started in 1980, EPA (or the “potentially responsible party”) was responsible for cleaning up properties on a list of the worst sites in the country. Over the years, some states have established their own hazardous waste cleanup programs and developed understandings with EPA on a division of responsibility in managing these cleanups and ensuring that national standards are met.

B.1.2. The growing strength of state environmental programs

To understand the decentralization of environmental management programs in the United States, it is essential to understand an overarching trend – the increasing strength of state programs during the past 30 to 35 years. As discussed above, in the early 1970s, EPA tended to have staff who were more knowledgeable than their state counterparts about environmental protection. The staff had a mandate to ensure rapid implementation of the newly enacted national environmental laws. Many states at that time did not have laws and regulations that were consistent with the new national laws. Also, staff at the state level often lacked the authority (and the expertise) to administer these programs. During the past three or four decades, the states have developed the needed laws, staff expertise, and processes, and some states are now stronger and more progressive in certain areas than EPA.

That said, state performance is still somewhat uneven. There are “strong states” and “weak states” throughout the country, and within any given state there are often stronger and weaker programs. States are generally required to adopt regulations that are as stringent as the federal requirements before EPA will delegate the program to them. However, in most (but not all) programs, the states are permitted to adopt regulations that are *more* stringent than the federal requirements. This results in a natural tension when the states are confronted with decisions regarding how stringent their regulations should be. Stricter regulations may discourage industry from locating in the state, and in recent years, as the competition between the states for attracting new industry has increased, some states have taken steps to ensure that their standards are no more stringent than the national standards. However, some states have been willing to establish higher standards because their citizens demand such standards and/or can afford the additional degree of environmental protection. For a few programs – auto emissions standards, for example – the states are not permitted to establish more stringent requirements in order to provide a degree of certainty to industry and/or to ensure national consistency.²² The U.S. system has evolved in this way because the country has a large economy and is geographically diverse.

B.2. Some overarching principles of EPA-state relationships

Since EPA was formed in 1970, EPA-state relationships have always been a major issue. These relationships have evolved over time and reflect a number of factors, including the philosophy of the political administration in office. However, certain overarching principles have emerged and, although not formally adapted, seem to have been accepted by EPA and the states as important to the success of the environmental programs in the United States. Four of these principles will be examined here.

B.2.1. Neither EPA nor the states can be successful without a strong working relationship between the federal and state levels of government.

Both EPA and its state counterparts have the same goal – protecting human health and environment. Over the years, the methods for reaching this goal have been agreed upon by EPA and the states. However, in some areas, the means to the goal are still subject to considerable debate. The following are some of the questions that have been debated for years – and will most likely continue to be debated for years to come.

- Should EPA and the states try to ensure compliance with environmental requirements primarily by aggressive enforcement against the regulated community, or by providing assistance to entities who have compliance problems?

²² California is the only state authorized by statute (Clean Air Act of 1970) to set its own auto emissions standards.

- How much information should the states be required to report to EPA?
- To what extent must the states follow EPA “guidance,” especially guidance that may go beyond the specific requirements of the legislation or regulation?

Over the years, many committees and processes have been established to debate those issues. The Environmental Council of the States (ECOS) (<http://www.sso.org/ecos>) is an influential organization that develops consensus state positions on various issues and negotiates these issues with EPA. ECOS also works with top EPA political and career leaders to establish a framework for resolving differences. Likewise, the leaders of the respective programs – air, water, hazardous waste – at EPA and in the states also meet frequently to resolve issues unique to their area of responsibility.

It should be noted that EPA relies considerably on its 10 regional offices to be the primary contacts with the states on issues of program implementation. These regional offices, under the leadership of the presidentially appointed regional administrators, are responsible for working with the states to resolve any issues regarding national policies. National policies and regulations are established in close coordination with the states. However, the 50 states do not always speak with one voice. Indeed, the 10 EPA regions do not always speak with one voice, either.

The art of developing national policies and regulation involves achieving consensus by as many states (and EPA regions, NGOs, and other stakeholders) as possible. Acting individually or collectively, the states could go to court to seek resolution of policies that they believe are not consistent with national legislation. This legal course of action is currently being followed to resolve interstate air pollution problems. The bottom line, however, is that it is much more effective for EPA and the states to resolve any differences through discussions and negotiations. In practice, a large majority of the issues are resolved in that way.

B.2.2. The nation benefits from national consistency in implementing environmental programs.

One major reason for enacting environmental legislation at the national level is to ensure consistent application of environmental protection throughout the United States. Lack of consistent permit requirements or consistent penalties for noncompliance could potentially result in “pollution havens” that would give unfair economic advantages to particular industries or states.

To address the issue of national consistency, national ambient standards and national technology-based effluent or emissions standards have been established. During the 1980s, after many negotiations between EPA and state representatives, national policies were also established to ensure consistency in enforcement actions if significant permit

violations occur. Basically, these enforcement policies seek to take away the economic benefit that a violating facility may realize by actions that result in the violation.²³

If state enforcement officials do not impose penalties at least at the level dictated by the national penalty policy, EPA reserves the right to impose its own penalty. Of course, in the case of both permits and enforcement, the specific facts of the situation can, and occasionally do, lead to disagreements between EPA and the state. Additionally, the imposition of additional penalties by EPA is usually viewed by the state as an embarrassment, or at least a negative public reflection on its ability to administer the program. Frequent discussions at all levels of EPA and the state organizations usually diffuse such disagreements before they become public issues.

B.2.3. Decisions are best made by those close to the environmental problem.

Over the years, the general principle of having environmental decisions made by a qualified authority close to the problem has become widely accepted. Therefore, assuming that the state has the proper authority and makes decisions that are consistent with national policy, delegating national programs to the states is generally viewed as desirable. It is generally assumed that the states know the local environment, local stakeholders, and local political, economic, and social circumstances better than someone in a remote EPA office. EPA, however, is expected to know enough about state decisions made regarding major facilities to ensure that these decisions are consistent with national policy. This requires the good-faith sharing of information.

B.2.4. Active stakeholder involvement and sharing of environmental data are encouraged.

The fourth principle that has emerged over the years is the desirability of openly sharing information and actively involving the interested stakeholders in the decisionmaking processes.

To make decisions that are acceptable to all parties – EPA, the states, the public, nongovernmental organizations, and the regulated community – it is important that the parties have open access to all pertinent information. Therefore, EPA and the states have increasingly made available information on discharges and emissions, compliance, and ambient air quality. EPA and the states put much of these data on the Internet, and environmental groups can then put their analyses of the data on their Web sites. For example, Environmental Defense, an environmental nongovernmental organization,

²³ For example, if an industrial plant neglects to install pollution control equipment as required, it theoretically would have more resources available for other investments and would thus gain an economic benefit by not complying with the permit requirements. The penalty policies were designed to ensure that penalties levied would offset that economic benefit. Additional penalties could be imposed for repeat violators or for severe environmental impacts.

uses raw discharge and emissions data that industry is required to submit to EPA, analyzes the data, and posts lists of the “worst polluters” on the Internet. Citizens – and sometimes EPA and the states – use these analyses to encourage polluters to reduce their impacts on the environment. Similarly, the posting of compliance data by EPA and states on the Internet acts as an incentive for noncomplying facilities to comply with their permits.

Affected parties also have opportunities to have their voices heard in the development of permits. Under the permitting provisions of essentially every major federal environmental law, the permit applicant is given a chance to discuss the requirements of the permit with the issuing authority (EPA or the state). In addition, NGOs and individuals can typically request a public hearing, appeal the permit decision, and seek judicial relief. The public and nongovernmental organizations typically also have an opportunity to take judicial actions against polluters if EPA or the states do not enforce actions against violators.

This active involvement by interested stakeholders in all major governmental decision processes and the increasing availability of environmental data on the Internet are generally viewed by EPA and the states as desirable approaches to ensure that decisions are made as openly as possible.

B.3. Advantages and disadvantages of decentralization

Although the four principles discussed above are now widely accepted in the United States, the art of managing EPA-state relations so that these principles are in proper balance during the daily interactions remains a challenge. The large majority of issues between EPA and the states are resolved amicably, but tensions exist. It has been argued that total national consistency is difficult to attain because environmental professionals in the 10 EPA regions and 50 states are making different decisions on similar facilities. Conversely, it has been argued by local officials that it would be folly to regulate every facility in the country in the same way, since some local situations are unique.

It is because of such tensions that the various national policies continue to be debated and refined by EPA and the states. The trend is definitely toward more delegation of national programs to the states. Indeed, for most major programs – air, water, hazardous waste – the majority of the states have been delegated primary responsibility for implementing the programs. In general, the older the national program, the more states have been delegated the lead. Another trend is that the states are sharing more information not only with EPA but also with the public.

In general, EPA prefers to delegate the major environmental programs to the state under the following conditions:

- The states demonstrate that they have the appropriate state laws and regulations in place to ensure that national objectives are met.
- The state has sufficient expertise and staffing levels.
- The state has a commitment to share with EPA the information that EPA needs to monitor the state's program.

The following observations can also be made about the U.S. system of decentralization:

- A program is generally delegated to the states more frequently as it matures.
- Certain sensitive programs (e.g., criminal enforcement) are not delegated. In fact, all EPA criminal investigators, though located in EPA regional offices, report directly to EPA headquarters. Despite this autonomy, EPA criminal investigators have developed partnerships with their state counterparts.
- EPA's system of decentralization is also driven by the size of the country and the complexities of the industries.
- Many fruitful collaborations between EPA and the states do not involve formal delegation. For example, EPA and the states often collaborate on environmental education efforts and on scientific studies.

B.4. Coordination mechanisms used by EPA and the states

Planning approaches and systems of checks and balances have been developed to help ensure that EPA and the states successfully implement the national environmental programs. Several examples are provided below.

B.4.1. EPA-state planning partnerships

In 1993 Congress passed the Government Performance and Results Act (GPRA). This law requires that each federal agency develop a strategic plan with measurable goals and objectives. EPA and other federal agencies must report to Congress on their progress in meeting these goals, and this planning and performance tracking program is considered in determining the level of funding that the agencies receive. In addition to EPA's agency-wide strategic plan, each of EPA's 10 regional offices has developed a strategic plan that reflects its specific environmental issues.

Since the 1970s, EPA and the states have experimented with ways to engage the federal and state levels of government in joint planning and priority setting. Since the passage of GPRA, these activities have received additional focus. Both EPA and the states recognize that implementing numerous environmental programs with limited government staff requires a common vision and a sense of federal-state teamwork. EPA and the states generally view a structured planning process as an opportunity to establish joint priorities based on the best environmental data, allocate responsibilities

between EPA and the states, build trust and positive relationships, and provide a forum for EPA and the state officials to discuss areas of mutual concern.

Joint EPA-state planning efforts are currently called performance partnerships and are documented in performance partnership agreements (PPAs), which are typically signed by the EPA regional administrator and the counterpart state environmental secretary or commissioner. Although the overall framework for the PPAs have been established by the EPA administrator and a group of representative secretaries of the environment at the state levels, considerable flexibility is given to the regional administrators regarding the content of individual PPAs (see <http://www.epa.gov/ocirpage/nepps/index.htm> for more information on the established framework). While generally adhering to the established national framework, the individual PPAs may differ considerably, depending on the needs of a particular state. The process is often further enriched by an opportunity for the public and other stakeholders to comment on the content of the PPA before it is finalized. The signed PPAs are not legally binding on either party but instead represent a good-faith effort between the parties to guide their respective organizations toward better environmental protection. Examples of PPAs are agreements for sharing environmental data, allocating responsibilities for enforcement actions, and jointly undertaking special environmental studies (see <http://www.epa.gov/ocirpage/nepps/agreements.htm> for additional examples).

Two relatively recent concepts in some PPAs are (i) the connection between the PPAs and the grants that EPA give the state to implement their programs, and (ii) the idea of “differential oversight.” In some states the PPA is supplemented by a performance partnership grant, which combines two or more state program grants. A performance partnership grant can reduce the administrative burden of processing the grants, lessen the reporting burden on the state, and give the state some increased flexibility in how it uses the monies.

The concept of differential oversight addresses the states’ interest in having EPA’s review of state actions calibrated to the strength of the state programs. Thus, if EPA finds that a particular state program has been consistently performing in an outstanding manner, EPA would lessen its oversight by, for example, undertaking fewer reviews of state-issued permits and reducing its involvement in state enforcement initiatives. The overall goal is to decrease any EPA duplication of state work in high-performing programs, thus enabling EPA to redirect its limited resources to priority areas. Conversely, poor state program performance may result in additional EPA involvement to ensure improvement.

In the future, it is expected that the content of the PPAs and the performance partnership grants will continue to evolve but that the underlying principles of accountability, flexibility, and a focus on environmental data will remain the foundation

of these agreements. See

http://www.epa.gov/ocirpage/nepps/reviews/reviews_evaluations.htm for current evaluations of the EPA- state performance partnerships and recommendations for improvements to the process.

B.4.2. Congressional mandates and oversight of environmental programs

In addition to passing environmental legislation, Congress also appropriates EPA funds each year, requires that EPA set specific environmental goals (see EPA's strategic plan at <http://www.epa.gov/oefu/plan/plan.htm>), and reviews the agency's progress toward these goals. As noted above, GPRA requires that each agency develop a strategic plan with goals, objectives, and measures of success. GPRA also requires that EPA submit performance reports each year. (see <http://www.epa.gov/ocfu/finstatement/2003ar/2003ar.htm>). Ultimately, lack of performance could reduce funding for the agency. EPA relies on its regional offices and the states to collect the information needed to provide these reports to Congress. This information must be received in a timely fashion and be in a consistent format.

Congress uses its Government Accountability Office (GAO) to investigate specific areas of EPA's performance. Congress also holds "oversight" hearings on the agency's performance.

The following sections describe some of the mechanisms used by EPA and the states to ensure a high level of performance.

B.4.3. State program grants

EPA provides the states with funding to implement the major national environmental programs. These funds usually represent 25% to 60% of the total state funds for the programs. The EPA grants typically are conditional and may require the particular state to issue a specific number of major permits, supply EPA with certain information, do special studies, or develop a specific policy that is consistent with national goals. The grant conditions are negotiated each year by EPA's regional offices and the states in their region. If the state does not meet the grant conditions, EPA may withhold some funding for the following year (this is rare, but the threat exists).

B.4.4. Audits and performance reviews

EPA headquarters reviews performance data from the EPA regional offices, which in turn review the performance of the states. In addition to reviewing performance data submitted by the states (increasingly in electronic form), EPA occasionally also audits performance by visiting the state offices, reviewing files, and interviewing state managers. Issues such as the quality control of information, adequacy of applying

national standards and policy to state decisionmaking, and state-EPA working relationships are discussed. A written report is often produced by EPA and reviewed by the state, and corrective measures are agreed upon where needed.

B.4.5. The dynamics of program delegation

As discussed above, most major programs are not delegated until the state demonstrates its capacity to administer the program in a way that is consistent with national standards. If a state does not meet these performance expectations, EPA reserves the right to take back the program. Citizens can petition EPA to rescind the delegation. Although discussions between EPA and poor-performing states are sometimes held, such actions are rarely taken by EPA, since it is in everyone's best interest to correct the performance problem. The states generally have many more staff than EPA does to administer the programs, and taking away state authority would be a political embarrassment to the state. The states also occasionally threaten to return administration of the programs to EPA if they consider the EPA-imposed directives too burdensome. However, it is very rare for delegated programs to be returned to EPA.

B.4.6. EPA's inspector general

The EPA inspector general often examines programs administered by EPA and the states if there are suspicions of fiscal mismanagement or program ineffectiveness. The inspector general is free of any EPA management control and can make her reports public. Such independent reviews also help ensure proper management by EPA and the states.

B.4.7. The influence of the media and NGOs

With the proliferation of information, the news media and nongovernmental organizations can conduct studies and analyses of EPA and state performance. As noted above, a great deal of information is available on the Internet. In addition, the federal government's Freedom of Information Act allows any citizen to review government reports or data (unless protected by the business confidentiality or enforcement confidentiality provisions of the act). With open access to information, it is not unusual for stories related to program performance to appear in newspapers and NGO magazines.

Appendix C. Ministry of the Environment Organizational Diagrams

Figure 1. Organization of the Ministry of the Environment, 1996

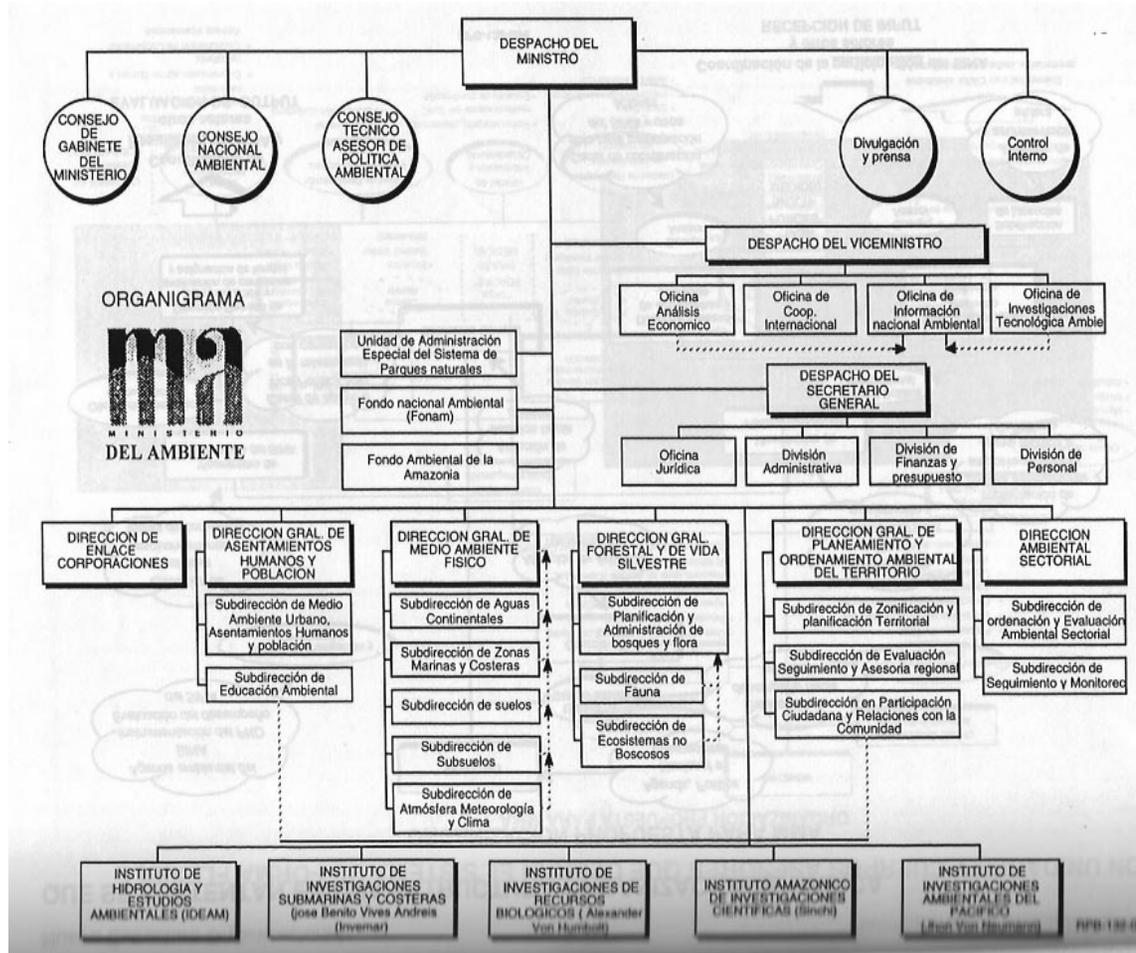


Figure 2. Organization of the Ministry of the Environment proposed by Booz-Allen & Hamilton, 1997

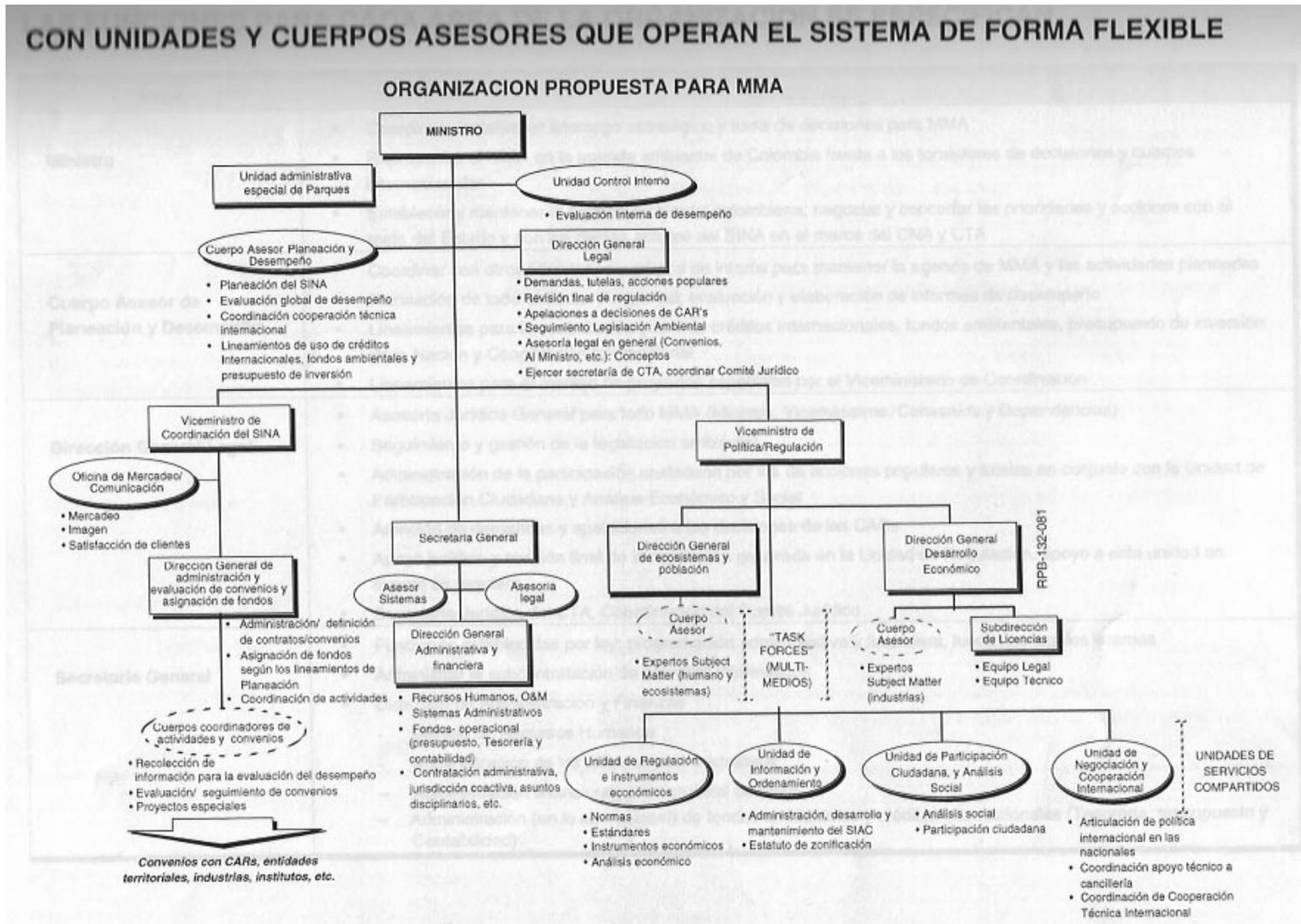
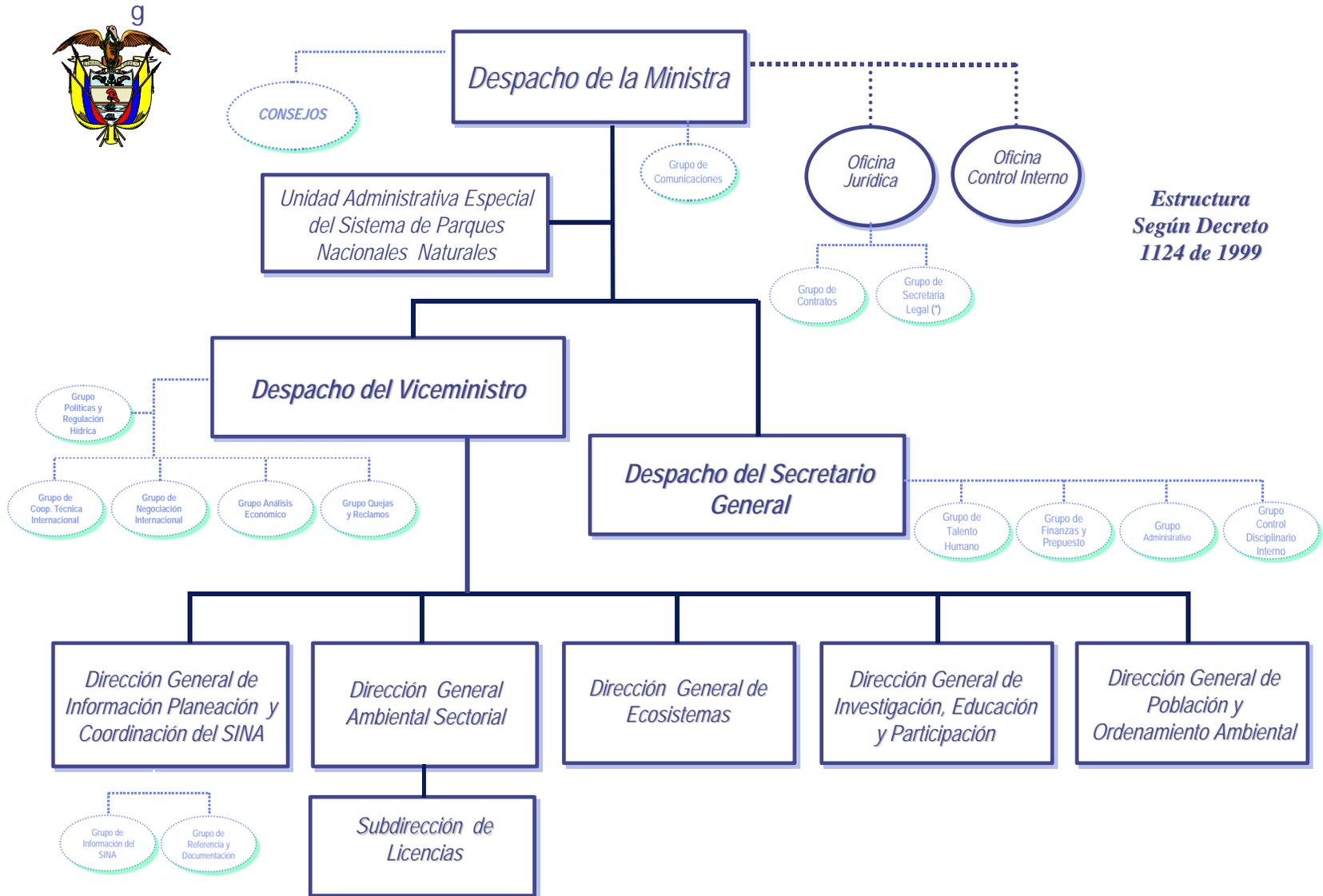
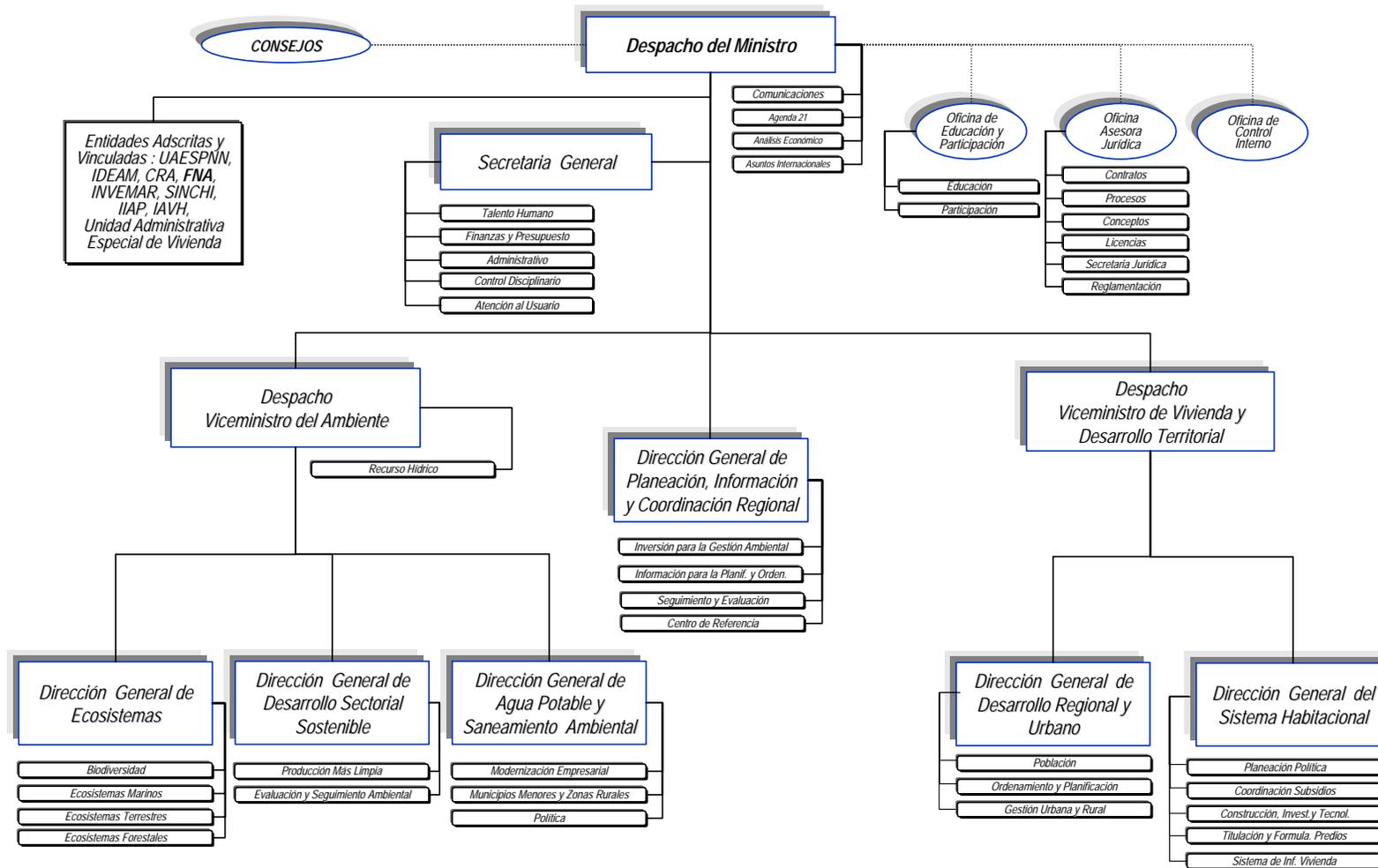


Figure 3. Organization of Ministry of the Environment mandated by Decree 1124 of 1999



*Estructura
Según Decreto
1124 de 1999*

Figure 4. Organization of the Ministry of Environment, Housing and Economic Development (MAVDT) 2004



Appendix D. Glossary of Spanish Acronyms Used in this Report

AAU	<i>Autoridad Ambiental Urbana</i> – Urban Environmental Authority
ACCI	<i>Agencia Colombiana de Cooperación Internacional</i> – The Colombian International Cooperation Agency
ASOCARs	<i>Asociación de Corporaciones Autónomas Regionales de Desarrollo Sostenible y Autoridades Ambientales de Grandes Centros Urbanos</i> – Association of Autonomous Regional Corporations, Sustainable Development Corporations and Urban Environmental Authorities
AVMA	<i>Autoridad Ambiental Urbana del Area Metropolitana del Valle de Aburrá</i> – Aburrá Valley Urban Environmental Authority
CAR	<i>Corporación Autónoma Regional</i> – Autonomous Regional Corporation
CDS	<i>Corporación de Desarrollo Sostenible</i> – Sustainable Development Corporation
CVC	<i>Corporación del Valle del Cauca</i> – Autonomous Regional Corporation of the Cauca Valley
CONPES	<i>Consejo Nacional de Política Económica y Social</i> – National Council on Economic and Social Policy
DADIMA	<i>Autoridad Ambiental Urbana del Distrito de Barranquilla</i> – Barranquilla Urban Environmental Authority
DAGMA	<i>Autoridad Ambiental Urbana de Cali</i> – Cali Urban Environmental Authority
DAMA	<i>Autoridad Ambiental Urbana de Santafé de Bogotá</i> – Bogotá Urban Environmental Authority
DANE	<i>Departamento Administrativo Nacional de Estadística</i> – National Administrative Statistics Department
DNP	<i>Departamento Nacional de Planeación</i> – National Department of Planning

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FAA	<i>El Fondo Para la Acción Ambiental</i> – National Fund for Environmental Action
FCA	<i>Fondo de Compensación Ambiental</i> – Environmental Compensation Fund
FNR	<i>Fondo Nacional Regalías</i> – National Royalty Fund
FONAM	<i>Fondo Nacional Ambiental</i> – National Environmental Fund
IDB	InterAmerican Development Bank
IDEAM	<i>Instituto de Hidrología, Meteorología y Estudios Ambientales</i> – Institute of Hydrology, Meteorology and Environmental Studies
IGAC	<i>Instituto Geográfica Agustín Codazzi</i> – Agustín Codazzi Geographic Institute
IIAP	<i>Instituto de Investigaciones Ambientales del Pacífico</i> – Institute for Pacific Environmental Research
INDERENA	<i>Instituto Nacional de los Recursos Naturales Renovables</i> – National Institute of Natural Renewable Resources and Environment
INVEMAR	<i>Instituto de Investigaciones Marinas y Costeras José Benito Vives de Andrés</i> – José Benito Vives de Andrés Marine and Coastal Research Institute
MAVDT	<i>Ministerio del Ambiente, Vivienda y Desarrollo Territorial</i> – Ministry of Environment, Housing and Territorial Development
MMA	<i>Ministerio del Medio Ambiente</i> – Ministry of Environment
MVDE	<i>Ministerio de Vivienda y Desarrollo Económica</i> – Ministry of Housing and Economic Development
PAT	<i>Plan de Acción Triannual</i> – Triennial Action Plan
PGAR	<i>Plan de Gestión Ambiental Regional</i> – Regional Environmental Management Plan
POAI	<i>Plan Operativo Anual de Inversiones</i> – Operative Annual Investment Plan
SIA	<i>Sistema de Información Ambiental</i> – Environmental Information System

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SIAC	<i>Sistema de Información Ambiental de Colombia</i> – System of Colombian Environmental Information
SINA	<i>Sistema Nacional Ambiental</i> – National Environmental System
SINCHI	<i>Instituto Amazónico de Investigaciones Científicas</i> – Amazon Institute of Scientific Researc
UAESPNN	Unidad Administrativa Especial del Sistema de Parques Nacionales Naturales – National Natural Parks System Special Administrative Unit

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