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## Wildlife in the Third World: Current Efforts to Integrate Conservation with Development

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# WILDLIFE IN THE THIRD WORLD: CURRENT EFFORTS TO INTEGRATE CONSERVATION WITH DEVELOPMENT

- I. INTRODUCTION
- II. THE DISRUPTION OF LOCAL POPULATION AND ACTIVITY
- III. OVERPOPULATION
- IV. DOMESTIC POLITICAL DISRUPTION
- V. TOURISM
- VI. POACHING
- VII. CONCLUSION

## I. INTRODUCTION

The American and European philosophy toward wildlife management is basically a protectionist one: to set aside land, to preserve it in its natural condition, and to limit human involvement to cases where a species is threatened or endangered. With a few exceptions such as Yellowstone National Park and McKinley National Park, most American and European parks are "locked-up" and human access is limited.<sup>1</sup> The protectionist view is that animal species will survive, and even thrive, as long as they remain isolated from human contact.

Programs designed to protect and preserve wildlife, land, and ecosystems<sup>2</sup> have been successful in the United States and Europe because developed countries can afford to designate land for such purposes and the public seems to support and defend the protection of natural resources.<sup>3</sup> Applying the protectionist philosophy to the natural resource policies of lesser-developed countries has not resulted in equal success. In view of their overpowering need to utilize limited resources, the lesser-developed countries have been reluctant to exempt any land from development.

As a result, a new philosophy has emerged which is more responsive to Third World problems: the integration of conservation with economic development by setting aside protected areas.<sup>4</sup> Conservation is the wise use of natural resources.<sup>5</sup> Conservation-

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<sup>1</sup> *The Road from Bali*, IUCN BULL., Oct.-Dec. 1982, at 77.

<sup>2</sup> Ecosystems are living systems where populations of organisms and species evolve and adapt to the environment and to each other. Kovda, *Contemporary Scientific Concepts Relating to the Biosphere*, in UNESCO, *Use and Conservation of the Biosphere 17* (1970). Ecosystems are adjusted, stable mechanisms capable of resisting, by self-control, changes in the environment. *Id.* If, however, changes in the environment are extreme, the harmony of the ecosystem can be irreversibly disturbed. *Id.* In cases where landscapes are altered by human activities such as tree-cutting and burning, an ecosystem can suffer irreparable damage. *Id.*

<sup>3</sup> Shelton, *Parks and Sustainable Development*, NAT'L PARKS, May-June 1983, at 16, 18.

<sup>4</sup> A protected area is defined as follows:

- a. "Protected area" means national park or national reserve;
- b. "National park" means an area established for the protection and conservation of ecosystems, containing animal and plant species, geomorphological sites and habitats of special scientific, educative, and recreational interest, or a natural landscape of great beauty, which is under the control of the appropriate public authority and open to visits by the public;

oriented land use is based on the premise that land needs to be planned, developed, and managed with specific objectives in mind for bringing the benefits of nature to society.<sup>6</sup> With direct and effective management, it is now generally recognized that land used for wildlife-related purposes is more profitable, both locally and nationally, than land used for agriculture. For example, studies in Kenya have shown that a successful park earns up to one hundred times more revenue, acre for acre, than a farm or a ranch would earn on the same site.<sup>7</sup>

The destruction which has resulted from development activities such as mining, logging, and agriculture has made people and their governments in lesser-developed countries increasingly aware of the need for a strategic approach toward the sustainable use of their natural resources. Several international organizations promote such a strategic approach. The World Wildlife Fund [WWF],<sup>8</sup> the United Nations Educational, Scientific, and Cultural Organization [UNESCO],<sup>9</sup> the Food and Agricultural Organization of the United Nations [FAO],<sup>10</sup> and the United Nations Environmental Program

c. "National reserve" means an area recognized and controlled by the appropriate public authority and established for protection and conservation of nature, and includes strict nature reserve, managed nature reserve, wilderness reserve, fauna and flora reserve, game reserve, bird sanctuary, geological or forest reserve, archaeological reserve and historical reserve, these being reserves affording various degrees of protection to the natural and cultural heritage according to the purposes for which they are established.

Convention on Conservation of Nature in the South Pacific, June 12, 1976, Article 1, *reprinted in* IUCN BULL., Aug. 1976 (Supp.).

<sup>5</sup> Conservation includes both a range of management techniques and a set of planning procedures to assist national and local authorities to husband, restore, and use natural resources for the benefit of their peoples. Second Regional Symposium on Conservation of Nature in the South Pacific, June 17, 1976, Recommendations: Conservation and Development, *reprinted in* IUCN BULL., Aug. 1976 (Supp.).

<sup>6</sup> *The Road from Bali*, *supra* note 1, at 77.

<sup>7</sup> May, *Preservation for Profit*, N.Y. Times, Sept. 12, 1982, § 6 (Magazine), at 146.

<sup>8</sup> The WWF was founded in 1961 by a group of prominent conservationists from the United States, Switzerland, and Great Britain, including Russell Train, the current President of World Wildlife Fund — U.S., and Sir Peter Scott. WWF — International and its twenty-four national organizations currently provide financial assistance to many thousands of projects relating to the conservation and maintenance of habitats and species. *See* World Wildlife Fund — U.S., 1983 ANN. REP. 33-38 (1984). The WWF receives its financial support from private individuals, foundations, and corporations. *Id.* at 39-41. In 1983, individuals contributed US\$4.097 million and foundations and corporations contributed US\$.936 million to World Wildlife Fund — U.S. *Id.* at 41.

<sup>9</sup> In 1970, UNESCO launched the Man and the Biosphere Program ["MAB"] to "collect, exchange and disseminate information" concerning the "scientific aspects of the rational use and conservation of natural resources of the biosphere and the improvement of the global relationship between man and his environment." UNESCO Res. 2.3131, UNESCO General Conference (16th Sess.) Vol. 1 at 35, U.N. Doc. C/DR.159 (1971). The biosphere is the portion of the earth and its environment in which life exists and sustains itself, including the atmosphere, hydrosphere, and lithosphere (soil, minerals, and sedimentary rock). UNESCO, Tropical Forest Ecosystems 41-42 (1978). The biosphere, as a total combination of ecosystems, is the highest level in the organizational structure of living matter on the earth. *Id.* The MAB is designed to study the "structure and functioning of the biosphere and its ecological regions, the . . . changes brought about by man in the biosphere . . . [and] the over-all effects of these changes upon the human species itself. . . ." UNESCO Res. 2.3131, UNESCO General Conference (16th Sess.) Vol. 1 at 35, U.N. Doc. C/DR.159 (1971). Through scientific research (notably, genetic resource research), monitoring of ecosystems, and the promotion of environmental education and training, the MAB has been a substantial contributor to the organizational effort to promote the integration of conservation with development.

<sup>10</sup> The United Nations established the FAO in 1945 to "collect and disseminate information,

[UNEP],<sup>11</sup> provide financial support to projects and studies which link conservation with sustainable development. The International Union for Conservation of Nature and Natural Resources [IUCN],<sup>12</sup> receives funds from these sources in order to provide scientific and technical assistance to conservation projects in the lesser-developed countries.<sup>13</sup>

The IUCN is currently composed of 508 governmental and non-governmental members from 114 countries.<sup>14</sup> The IUCN has taken an active role in promoting the integration of conservation with development primarily through its world-wide network of scientific and technical specialists.<sup>15</sup> These specialists are currently involved with over 300 conservation-oriented projects in ninety countries where their role involves planning, development, and active management.<sup>16</sup>

In March, 1980, the IUCN launched the World Conservation Strategy [WCS].<sup>17</sup> The WCS is designed to stimulate a more focused approach to the management of natural resources and to provide policy guidance for its implementation.<sup>18</sup> In short, the WCS:

- a. defines natural resource conservation and explains its objectives, its contribution to human survival and development, and the main impediments to its implementation;
- b. determines the priority requirements for achieving each of the objectives;
- c. proposes national, regional, and local strategies to meet the priority requirements and describes a framework for those strategies;
- d. recommends reviews of legislation concerning natural resources and suggests general principles for organization within government; and

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give advice and organize missions of technical experts, and make studies and recommend action to other international agencies and to governments," on matters relating to food, nutrition, agriculture, forestry, and fisheries, especially in the developing countries. FAO, Report of the First Session of the Conference at 2 (1946). Many subsidiary committees have been established by the FAO to gather data and calculate statistics which, in some cases, can be used to support conservation strategies. The Committee on Forestry, for example, completed a report in 1982 which found that tropical forests in seventy-six countries were being destroyed at a dangerous rate. This report is discussed in Part II of the text.

<sup>11</sup> The United Nations established UNEP in 1972. UNEP has given priority to the study of the functioning of terrestrial ecosystems and their rational management. UNESCO, *Preface to Tropical Forest Ecosystems* (1978). Arid lands, rangelands, pastures, forests, and tropical wooded areas have been selected by UNEP for special study and urgent action. *Id.* UNEP has co-ordinated many of its studies with UNESCO and the FAO.

<sup>12</sup> The IUCN was founded in 1948 by a group of prominent scientists from the United States and Europe, including Dr. Harold J. Coolidge, Jr., United States; Dr. F. Fraser Darling, Great Britain; Mr. Johannes Goudswaard, The Netherlands; Professor J.P. Harroy, Belgium; Professor Reino Kalliola, Finland; and Mr. H. Flon, France. *IUCN and UNESCO: Old Ties Lead to New Cooperation*, IUCN BULL., July-Sept. 1982, at 45 [hereinafter cited as *IUCN and UNESCO*].

<sup>13</sup> In 1983, for example, the IUCN received US\$.3257 million from the WWF-US. World Wildlife Fund — U.S., 1983 Annual Report 33-38 (1984). The IUCN and the WWF have a close relationship and the IUCN is now considered to be the scientific arm of the WWF. Telephone interview with Randall Kremer, Information Officer of World Wildlife Fund — U.S. (May 3, 1984).

<sup>14</sup> The list of members includes 58 countries, 121 government agencies, 298 national non-governmental organizations, 25 international non-governmental organizations, and 6 affiliates. *Memorandum, IUCN Welcomes New Members*, IUCN BULL., Oct.-Dec. 1983, at 106.

<sup>15</sup> *IUCN and UNESCO*, *supra* note 12, at 45.

<sup>16</sup> *Assembly Issues: The Director General Looks at IUCN*, IUCN BULL., Oct.-Dec. 1981, at 72.

<sup>17</sup> The World Conservation Strategy was produced in cooperation with the WWF, UNEP, and the international scientific community. *Id.*

<sup>18</sup> *The Strategy at a Glance*, IUCN BULL., March 1980, at 38.

- e. suggests ways of increasing the number of trained personnel for research and management.<sup>19</sup>

The IUCN's role in the WCS is to promote, monitor, and report on its implementation.<sup>20</sup> The IUCN promotes implementation of the WCS by providing technical specialists and consultants to a country's department of natural resources in order to develop a National Conservation Strategy [NCS] which is consistent with the objectives of the WCS.<sup>21</sup> The NCS identifies and assesses conservation and development problems and defines how natural resources can be better exploited for the common good.<sup>22</sup> As of September, 1983, thirty-two countries were at various stages of developing a NCS.<sup>23</sup>

The IUCN organized the World National Parks Congress [WNPC] which was held in Bali, Indonesia, in October, 1982.<sup>24</sup> The WNPC was co-sponsored by the IUCN, the WWF, the FAO, UNESCO, UNEP, Parks Canada, and the United States National Park Service.<sup>25</sup> Over 450 protected area managers, researchers, academics, advocates, and government officials from seventy countries discussed how parks are playing, or could play, a role in sustainable development.<sup>26</sup> Some examples demonstrated the connection between conservation and development: sales of thatch grass from Nepal's Chitwan National Park are producing US\$1 million per year;<sup>27</sup> US\$20,000 million worth of hydroelectric energy is being protected by Venezuela's Canaima National Park; and a system of protected areas is ensuring the productivity of irrigation systems in Sri Lanka and Indonesia.<sup>28</sup> The WNPC adopted twenty "Recommendations" relating to the significance of protected areas in sustainable development.<sup>29</sup>

Despite the internationally-based efforts to integrate conservation with development, the economic and social demands in many lesser-developed countries have slowed acceptance of this new approach. Domestic problems, such as the fear of disrupting local population and activity, and the demand for land resulting from over-population, must be reconciled when a government considers whether to set aside land as a protected area. The regulation of tourism requires high administrative costs to maintain an effective tourist bureau, hire and train tourist officials, build roads, and provide appropriate accommodations. The elimination of poaching requires financial support for the hiring of anti-poaching personnel and the establishment of anti-poaching education programs. The following sections will examine these problems and provide some examples of how they can be resolved.

## II. THE DISRUPTION OF LOCAL POPULATION AND ACTIVITY

Perhaps the most innovative conservation strategy has been to compensate those who must leave their homes or lose their historical rights to local natural resources because the

<sup>19</sup> *Id.* at 39.

<sup>20</sup> *Conservation Strategies: Progress and Obstacles*, IUCN BULL., July-Sept. 1983, at 81.

<sup>21</sup> *Id.*

<sup>22</sup> *Munro, What is a NCS?*, IUCN BULL., Apr.-June 1983, at 47.

<sup>23</sup> *Summary of NCS Progress*, IUCN BULL., July-Sept. 1983, at 83.

<sup>24</sup> *The Road from Bali*, *supra* note 1, at 77.

<sup>25</sup> *The Road from Bali*, *supra* note 1, at 77; *See also* Shelton, *supra* note 3, at 16.

<sup>26</sup> *The Road from Bali*, *supra* note 1, at 77; *See also* Shelton, *supra* note 3, at 16.

<sup>27</sup> *The Road from Bali*, *supra* note 1, at 77; *See also* Shelton, *supra* note 3, at 19.

<sup>28</sup> *The Road from Bali*, *supra* note 1, at 77.

<sup>29</sup> World National Parks Congress, Oct. 22, 1982, Recommendations, *reprinted in* IUCN BULL., Oct.-Dec. 1982 (Supp.) [hereinafter cited as WNPC]. A short outline of the Recommendations is published in National Parks, May-June 1983, at 21.

government wants to designate their land as a protected area. If the local people believe that they are receiving an appropriate share of the benefits which flow from protected areas, they may feel that they are being compensated appropriately for any loss of rights. For example, since the opening of Uganda's National Parks, the Ugandan government has given over half of the admission fees to local governments.<sup>30</sup> Two other examples highlight this development.

Amboseli, an arid basin in Kenya which contains a series of swamps, is a migration center in the dry season for elephants, buffaloes, rhinos, zebras, wildebeests, gazelles, impalas, and dozens of other species because water flows from the snow-capped peaks of Mt. Kilimanjaro.<sup>31</sup> The Masai, a nomadic tribe of cattleherders, have also migrated to Amboseli during the dry season for over 400 years.<sup>32</sup> In 1967, an angry conflict ensued between the Kenyan government, which wanted the area officially declared a park, and the local Masai, who wanted to continue to use the water resources and pastureland and who believed that the interests of the animals and tourists were being placed ahead of their own.<sup>33</sup> In protest, the Masai, known only for killing animals in self-defense, began spearing large numbers of rhinos.<sup>34</sup>

The Kenyan government and Kenya's Wildlife Planning Unit developed a plan to relocate the local Masai outside the protected area and to pipe water to the new location.<sup>35</sup> This would allow the wildlife exclusive use of the swamps. In an effort to persuade the Masai to approve the plan, the government offered to compensate the tribe for the loss of any cattle killed by predators.<sup>36</sup> The government also offered to charge an extra "bed fee" for each bed used by a tourist in a tourist lodge in Amboseli and to give the proceeds to the Masai tribal council for educational, housing, and medical purposes.<sup>37</sup> In 1977, the Masai agreed to leave the central watering area with these guarantees.<sup>38</sup>

In New Guinea's Ubai-gubi forest, a similar program, although still in the negotiation stages, is being developed.<sup>39</sup> The Ubai-gubi forest is renowned for its bird-of-paradise populations. The New Guinea government wants to set aside the Ubai-gubi forest as a bird-of-paradise reserve to attract tourists to its country, but local tribesmen hunt large numbers of these birds.<sup>40</sup> IUCN specialists are working closely with the government to set up the reserve so that the local tribesmen are a part of, and are compensated by, the protected area. The current plan calls for the local tribesmen to limit the number of birds they can hunt in return for part ownership in tourist camps and the proceeds from an additional bed fee.<sup>41</sup>

Another situation in Kenya highlights the need for such agreements between the local people and the government. The ecological balance of the Mt. Kulal Biosphere

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<sup>30</sup> S. ELTRINGHAM, *THE ECOLOGY AND CONSERVATION OF LARGE AFRICAN MAMMALS* 245 (1979).

<sup>31</sup> May, *supra* note 7, at 152.

<sup>32</sup> *Id.*

<sup>33</sup> *Id.*

<sup>34</sup> *Id.*

<sup>35</sup> *Id.* at 154; See also Shelton, *supra* note 3, at 19.

<sup>36</sup> May, *supra* note 7, at 154.

<sup>37</sup> *Id.*

<sup>38</sup> *Id.*

<sup>39</sup> Telephone interview with George Schaller, Director of the Animal Research and Conservation Center of the New York Zoological Society (July 12, 1983).

<sup>40</sup> *Id.*

<sup>41</sup> *Id.*

Reserve,<sup>42</sup> a 700,000 hectare<sup>43</sup> area in northern Kenya, is rapidly deteriorating. Four nomadic groups, the Rendille, Gabra, Turkana, and Sambura inhabit the reserve.<sup>44</sup> Their activities, such as overgrazing their livestock, and cutting trees for fuel and the construction of huts and fences, have caused serious soil erosion in the region.<sup>45</sup> Since this area has great potential for the development of tourism and fisheries,<sup>46</sup> a plan needs to be developed which could include direct compensation to the groups through employment and extra tourist fees in return for lessening, if not eliminating, their impact in this sensitive region.

The WNPC recognized the importance of direct compensation to local people affected by the designation of a protected area. The WNPC declared that it is important to be:

Aware of the special help which those living in or near protected areas can be in [establishing, supporting, and defending them] if they feel they share appropriately in the benefits flowing from the protected area, are compensated appropriately for any lost rights, and are taken into account in planning and operations; . . . [and therefore] the World National Parks Congress . . . requests governments and development assistance agencies to assist in providing support for local populations who may be disadvantaged by the establishment of a protected area; . . .<sup>47</sup>

The policy of promoting this type of national-local relationship should be central to government planning. If a country will benefit financially from an increased tourist industry and saleable resources in protected areas, it seems unfair to disrupt and displace the local people without some compensation. With proper planning and management, the above examples show that local people can benefit financially from activities related to the protected areas.

<sup>42</sup> A Biosphere Reserve is defined by UNESCO as "[a] protected area in which an integrated approach to conservation is to be developed, continuing the preservation of genetic and ecological diversity with scientific research, environmental monitoring, education and training." *UNESCO and the World Conservation Strategy*, IUCN BULL., July-Sept., at 48. There are five essential components of a Biosphere Reserve:

- a) it contains a core natural area which is a well-protected national park or nature reserve;
- b) it contains a larger buffer zone which surrounds the core area and may be occupied by people who will confine their activities to those which will be compatible with the conservation objectives of the reserve. These people should also be involved in management decisions which affect the area;
- c) it is the site of basic and applied research projects;
- d) it is the site of training for managers of protected areas and scientists; and
- e) it is the site of monitoring projects.

McNeely, *Why Biosphere Reserves?: An Introductory Note*, IUCN BULL., July-Sept. 1982, at 59. As of September, 1982, 215 Biosphere Reserves had been established in fifty-eight countries. *UNESCO and the World Conservation Strategy*, IUCN BULL., July-Sept. 1982, at 48.

<sup>43</sup> One acre is equal to .405 hectares; One square mile is equal to 258.999 hectares.

<sup>44</sup> *Lusigi, Mt. Kulal: Reconciling Conservation with Local Population Needs*, IUCN BULL., July-Sept. 1982, at 65.

<sup>45</sup> *Id.*

<sup>46</sup> *Id.*

<sup>47</sup> WNPC, *supra* note 29, at Recommendations: The Role of Protected Areas in Sustainable Development.

## III. OVERPOPULATION

The fundamental cause of the problems facing wildlife and wildlife areas is the growth and expansion of the human population.<sup>48</sup> The WNPC declared that "the successful pursuit of the full range of conservation efforts" depends upon "raising the living standards of many people in the developing world who are forced by their poverty to over-exploit natural resources."<sup>49</sup> Raising the living standards is certainly an important long-term goal, but the sheer growth of the human population presents a great short-term threat to natural resources.

The population of the world increased by 737 million between 1970 and 1980 and most of that increase, 653 million, took place in the lesser-developed countries.<sup>50</sup> Kenya's population, which is currently greater than sixteen million, is growing at four percent per year, the fastest growth rate ever recorded for any country.<sup>51</sup> In South Africa, a country with approximately twenty-eight million people, the population is expected to double to fifty-six million by the year 2005.<sup>52</sup> In order for South Africa to absorb the expected increase in urban population, twenty-seven new cities the size of Johannesburg will have to be built within the next twenty years.<sup>53</sup> This increase will demand more from the country's natural resources.

The population of most African nations will double during the next twenty-five years.<sup>54</sup> Besides requiring additional use of natural resources, population growth will also increase land scarcity and, therefore, increase the number of landless people. As a result, peasant farmers will continue to clear and plant lands, not because they are callous about natural resources, but because they must meet their immediate survival needs.<sup>55</sup>

Deforestation, through the cutting of trees for firewood and the burning of grass and trees for farming, presents a major threat to conservation efforts. If the cleared land is poorly managed or not suitable for farming, the farmer will move on to a different location and repeat this procedure.<sup>56</sup> This process is called "slash and burn agriculture."<sup>57</sup> A forest can be permanently destroyed when it is subject to even a short cycle of shifting cultivation of crops.<sup>58</sup>

A recent study of the world's tropical forests conducted by the FAO and UNEP<sup>59</sup>

<sup>48</sup> Fourth International Congress of the World Wildlife Fund, Dec. 1, 1976, *Preamble to Congress Resolutions*.

<sup>49</sup> WNPC, *supra* note 29, at *Preamble to Recommendations*.

<sup>50</sup> May, *supra* note 7, at 145.

<sup>51</sup> *Id.*

<sup>52</sup> *Population Demands*, AFRICAN WILDLIFE, Sept.-Oct. 1981, at 13.

<sup>53</sup> *Id.*

<sup>54</sup> *Growing Legions of the Landless*, IUCN BULL., Jan.-Mar. 1983, at 27.

<sup>55</sup> *Id.*

<sup>56</sup> Poore, *Deforestation and the Population Factor*, IUCN BULL., Jan.-Mar. 1983, at 25.

<sup>57</sup> Golden, *Complex Tropical Forests are Losing Ground*, The Boston Globe, April 9, 1984, at 37, col. 1.

<sup>58</sup> Poore, *supra* note 56, at 25. Once land is cleared, the terrain can become broken, and soil degradation and erosion prevent the forest cover from rising again after agriculture has been abandoned. Lanly, 30 FAO Forestry Paper 81 (1982) [hereinafter cited as Forestry Paper].

<sup>59</sup> The study, entitled "Tropical Forest Resources Assessment, Project No. FP/1301-78-04," examined tropical forests in Africa, Asia, and Latin America between 1978 and 1982. Forestry Paper, *supra* note 58, at 2. The study found that an area of tropical forest the size of New York City is being destroyed every four days. World Wildlife Fund — U.S., 1983 Annual Report 3 (1984).



estimated that 7.496 million hectares of closed forest<sup>60</sup> and 3.807 million hectares of open forest<sup>61</sup> are being destroyed annually by the extension of agriculture. The forest land is often unsuitable, poor, or marginal for farming purposes.<sup>62</sup> While the total rate of deforestation, including forest land that does not fit into the two categories above, is 11.303 million hectares per year,<sup>63</sup> the rate of establishment of tree plantations is 1.153 million hectares per year,<sup>64</sup> or approximately one-tenth the rate of destruction. The FAO/UNEP study also showed that, in 1980, 112 million people lived in areas of fuelwood scarcity,<sup>65</sup> and 1,179 million people met their minimum needs by using wood faster than it could be replaced.<sup>66</sup> These figures are even more staggering when considered in light of the projected population growth.

One conservation strategy which will not interfere with population growth is to set aside representative ecosystems. This plan protects valuable ecological areas while allowing most areas of little ecological significance to be used for other purposes such as agriculture or forestry production. The increase in agriculture or forestry production in one area can provide the financial support for protecting forest ecosystems in another area, while research projects in a protected area can improve the understanding of land-use problems in a non-protected area.<sup>67</sup> The policy of setting aside representative ecosystems was adopted by the WNPC.<sup>68</sup> A different policy of setting aside as much land as possible would directly conflict with population needs.

The WNPC also recommended that governments should increase the number of tree plantations in countries where forests are being destroyed.<sup>69</sup> An increase in the fuel and lumber supply would relieve the pressure on protected and non-protected areas where the local people might otherwise clear the land. In Brazil, for example, eucalyptus plantations are supplying eleven million of the thirty-eight million cubic meters of wood used annually for charcoal production and fuel.<sup>70</sup> The destruction of Brazil's natural forests would be far greater without the plantations.<sup>71</sup>

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<sup>60</sup> Forestry Paper, *supra* note 58, at 80. Closed forests have continuous overhead cover from broad-leaved, coniferous, or bamboo trees, abundant undergrowth, and they occur in areas with high rainfall. They are usually considered to be tropical rain forests. Hadley and Lanly, *Tropical Forest Ecosystems: Identifying Differences, Seeking Similarities*, UNESCO, NATURE AND RESOURCES, Jan.-Mar. 1983, at 7, 11.

<sup>61</sup> Forestry Paper, *supra* note 58, at 84. Open forests have continuous grass cover and do not have continuous overhead cover. They usually occur in drier regions. Hadley and Lanly, *supra* note 60, at 11.

<sup>62</sup> Forestry Paper, *supra* note 58, at 81; Poore, *supra* note 56, at 26.

<sup>63</sup> Forestry Paper, *supra* note 58, at 84. The FAO/UNEP study considered the word "deforestation" to mean the complete clearing of the forest and its replacement by another form of land use, namely, agriculture and grazing. Hadley and Lanly, *supra* note 60, at 11, n.1. A study commissioned by the United States National Academy of Sciences, however, reported that in 1980 the rate of deforestation was eighteen to twenty million hectares per year. *Id.* at 12. The latter study considered the word "deforestation" to mean the clearing of land into any other state. *Id.* This broader criteria includes logging and tree-cutting for fuel and shelter.

<sup>64</sup> Forestry Paper, *supra* note 58, at 72.

<sup>65</sup> *Id.* at 63.

<sup>66</sup> *Id.*

<sup>67</sup> See Hadley and Lanly, *supra* note 60, at 16.

<sup>68</sup> WNPC, *supra* note 29, at Recommendations: Global System of Representative Terrestrial Protected Areas.

<sup>69</sup> *Id.* at Recommendations: Threat to Protected Areas.

<sup>70</sup> Hadley and Lanly, *supra* note 60, at 18.

<sup>71</sup> *Id.*

Tree plantations also serve other purposes. Teak plantations can provide a long-term source of livelihood for local craftpersons and carpenters.<sup>72</sup> Fast growing trees, such as *leucana* and *erythrina* can reforest degraded land. The introduction of these trees has been successful in Costa Rica, India, Indonesia, and the Philippines.<sup>73</sup> Their roots help protect against erosion, and their leaves, after dropping to the ground, act as natural fertilizers which can revive a degraded forest.<sup>74</sup>

Another method of preventing the destruction of forests is to foster an appreciation for nature and the environment. Educational programs have been established and maintained in many lesser-developed countries. For example, the Wildlife Conservation Society of Zambia (the "Society"), a member of the IUCN and a non-governmental, non-profit organization, has established over 1,000 conservation clubs in Zambia's primary and secondary schools.<sup>75</sup> Club members receive educational magazines, guidebooks, posters, and wall charts, and are provided with frequent lectures, films, slide shows, and trips to areas of interest.<sup>76</sup> Some Society branches have their own camps, lodges, plots, and nature areas which may be used by the school children.<sup>77</sup> For adults, the Society offers seminars, workshops and training courses. The Society also maintains a weekly radio program and a regular column in the "Times of Zambia."<sup>78</sup>

In 1982, UNEP began a youth-oriented project called "For Every Child a Tree," which encourages a parent to plant a "birthday tree" for every child.<sup>79</sup> Children are being encouraged to ask that their tree be planted in an area where trees and forests have become threatened. Actress Cicely Tyson launched UNEP's program in Kenya in January, 1982.<sup>80</sup>

#### IV. DOMESTIC POLITICAL DISRUPTION

An educated and informed public may challenge a government's disregard for wildlife. Protected areas and wildlife are particularly vulnerable when government support does not exist or has broken down. The political situation in Uganda provides the best example. During the eight years of Idi Amin's rule, anti-poaching enforcement ceased to exist in Uganda's national parks and reserves.<sup>81</sup> As a result, poaching and human encroachment increased significantly.<sup>82</sup> Amin's soldiers, family, and friends hunted exclusively in Uganda's parks using high-powered rifles and helicopters.<sup>83</sup> The elephant population decreased from 30,000 to 2,000, and the rhinoceros, which was one of the most abundant species in Uganda, has virtually disappeared.<sup>84</sup>

<sup>72</sup> *Id.*

<sup>73</sup> *Id.*; Golden, *supra* note 57, at 37.

<sup>74</sup> Hadley and Lanly, *supra* note 60, at 18; Golden, *supra* note 57, at 37.

<sup>75</sup> Education Effort Takes Off in Zambia, IUCN BULL., Jan.-Mar. 1982, at 8.

<sup>76</sup> *Id.*

<sup>77</sup> *Id.*

<sup>78</sup> *Id.*

<sup>79</sup> UNEP Plans: A Tree for Every Child, IUCN BULL., Jan.-Mar. 1982, at 23.

<sup>80</sup> *Id.*

<sup>81</sup> *Good News for Uganda's Wildlife*, IUCN BULL., Jan.-Mar. 1982, at 26 [hereinafter cited as *Uganda's Wildlife*].

<sup>82</sup> *Id.* Poaching still exists in northeast Uganda's Kidepo Valley National Park. Sudanese army units, equipped with rifles, mortars, and rocket-propelled grenades, regularly kill elephants in the park. Hemenway, *A Warrior for Wildlife*, N.Y. Times, Jan. 10, 1983, § 6 (Magazine) at 56.

<sup>83</sup> *Uganda's Wildlife*, *supra* note 81, at 26; Hemenway, *supra* note 82, at 30.

<sup>84</sup> *Uganda's Wildlife*, *supra* note 81, at 26; Hemenway, *supra* note 82, at 29. The most abundant

A deterioration of the country's economy can lead to the same result. If money and land are scarce, many people may turn to poaching for lucrative income and tree-cutting and burning for more land. Each international wildlife conference has encouraged political and economic systems and mechanisms to protect against this type of disruptive change. If policies such as compensating the local population and educating the general public are established and maintained, any potentially adverse political change may not be tolerated. Conversely, government members may be reluctant to undermine support for conservation policies if they believe that local communities and the general public support them.

#### V. TOURISM

Another problem facing wildlife and wildlife areas is the presence of tourists and tourist-related accommodations. Safari lodges or tourist hotels require the establishment of a small to medium-sized village to accommodate members of the staff and their families.<sup>85</sup> A human establishment inside a park seems contrary to the idea of a natural park. Moreover, the roads or tracks inside parks can often cause erosion and loss of vegetation.<sup>86</sup> Tourists often drive off the road or track either in search of, or in pursuit of, wild animals.<sup>87</sup> Such activity disturbs the animals and destroys vegetation.<sup>88</sup> Nevertheless, tourism must be encouraged so that governments will consider conservation to be economically possible.

In a study of how man's activities in Tanzania affect large mammals, Gordon Matzke concluded that the presence of human establishments directly and drastically reduces the number of sightings of large mammals.<sup>89</sup> According to Stewart Eltringham, however, safari lodges in African national parks actually attract many types of wild animals including elephants and rhinos.<sup>90</sup>

Eltringham points out, however, that the major problems with safari lodges are that they affect the ecology of the area and alter the habits of wild animals. Some animals, such as gazelles and impalas, are attracted to the lush vegetation and the man-made waterholes around the lodge which are constructed so that guests can watch the animals drink and bathe.<sup>91</sup> These animals usually overgraze the lodge area instead of grazing in a larger area.<sup>92</sup> The illumination of the lodge area also makes it difficult for predators to strike.<sup>93</sup> Another common problem is that kitchen wastes are put out for scavengers such as hyenas and vultures.<sup>94</sup> On one occasion, unnaturally high numbers of marabou stork were attracted to the garbage dumped outside the lodge at Mweya in Uganda's Rwenzori National Park. The birds killed the surrounding trees by the way they roosted on them.<sup>95</sup>

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species of rhinoceros in Africa is the black rhino, but it may not exist in Uganda today. *Uganda's Wildlife*, *supra* note 81, at 26.

<sup>85</sup> S. ELTRINGHAM, *supra* note 30, at 241.

<sup>86</sup> *Id.* at 238-39.

<sup>87</sup> *Id.* at 239.

<sup>88</sup> *Id.*

<sup>89</sup> G. MATZKE, *WILDLIFE IN TANZANIA SETTLEMENT POLICY: THE CASE OF THE SELOUS* 110-11 (1977).

<sup>90</sup> S. ELTRINGHAM, *supra* note 30, at 241.

<sup>91</sup> *Id.*

<sup>92</sup> *Id.*

<sup>93</sup> *Id.*

<sup>94</sup> *Id.* at 242.

<sup>95</sup> *Id.*

Since the trees prevented erosion of the steep slope on which they grew, all that remains now is a series of deepening erosion gullies.<sup>96</sup>

Eltringham suggested decreasing the ecological impact on a protected area by placing the tourist hotels around the edge of a park. This would decrease traffic on the roads through a park and prevent the unnecessary alteration of the protected environment. Another protective measure is to erect high walls around the lodges. High walls have already been built around the Kilaguni and Ngulia lodges in Tsavo, Kenya.<sup>97</sup>

The governmental body responsible for establishing the policies for tourist accommodations should require tourist hotels to be placed outside the parks or to be surrounded by high walls. Tourists would not be substantially deprived of any benefit and the damage to revenue-making natural resources would be decreased.

As mentioned above, roads and tracks inside a park can cause adverse ecological effects. Since most roads are not paved, frequent traffic causes damage to roadside vegetation from blown dust.<sup>98</sup> Erosion is also common during periods of rainfall. When the roads are bumpy and broken, drivers tend to drive along the side of the road.<sup>99</sup> After that side of the road begins to erode, the drivers move further to the side.<sup>100</sup> Eltringham notes that in a short time an area of quagmire a hundred meters or more across replaces a former narrow track.<sup>101</sup> There are strict rules in most parks against driving off the road, but they tend to be ignored.<sup>102</sup>

One solution to the problems of erosion and road dust is to pave the roads. In some cases, however, the cost may be prohibitive. Another solution is to erect small fences or guardrails along the road, but this may detract from the natural beauty of a park. The best solution may be to deter wandering off the road by imposing and strictly enforcing fines for such activity. A heavy fine, like the fines in most American states for highway littering, would have a greater impact than a small fine. The payments could then be directly applied to the costs of constructing a paved road. Discouraging off-road travel would be the result and, in a turn of events, the violators would be contributing to the protection of the park.

The WNPC noted the threat to protected areas created by tourist-related activities. It recognized that there is a "continuing problem of degradation of protected areas from road construction and other works," and there is "the need to control the use of vehicles, boats, and aircraft affecting such areas."<sup>103</sup> The WNPC called upon governments to develop appropriate legislative and administrative mechanisms which would safeguard against adverse ecological effects from man's activities.<sup>104</sup> It may be a sad reflection of human conduct, but such laws or rules probably will not succeed in their goal unless accompanied by a heavy fine. Most people, especially tourists on a budget, would probably refrain from off-road driving if it would harm them financially.

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<sup>96</sup> *Id.*

<sup>97</sup> *Id.*

<sup>98</sup> *Id.* at 239.

<sup>99</sup> *Id.*

<sup>100</sup> *Id.*

<sup>101</sup> *Id.*

<sup>102</sup> *Id.*

<sup>103</sup> WNPC, *supra* note 29, at Recommendations: Threats to Protected Areas.

<sup>104</sup> *Id.*

## VI. POACHING

Another major problem facing wildlife is the widespread practice of poaching. Poaching is the illegal killing of animals in a protected area.<sup>105</sup> High-powered rifles and poisoned arrows are commonly used. Some cruder methods of killing have been used, such as wire snake traps and bananas mixed with sulfuric acid for bait.<sup>106</sup> The incentive is often the price for trophies. For example, zebra skins can sell for as much as \$2,000 per skin.<sup>107</sup> The price of ivory from elephant tusks increased from US\$2.30 per pound in 1970 to US\$34 per pound in 1980.<sup>108</sup> The WWF estimates that 50,000 to 150,000 elephants are being killed illegally each year from a total African population of 1.3 million elephants.<sup>109</sup> Poaching for meat is another problem and it is usually carried out by local people living just outside the park.

The WNPC recognized that poaching is "the most important threat to the integrity of some protected areas" and that "the uncontrolled international trade in wildlife continues to endanger numerous species."<sup>110</sup> The World Wildlife Fund has recommended that national governments should "take immediate action . . . to implement existing laws for the conservation of wildlife, and where inadequate legislation exists, to introduce such."<sup>111</sup>

Programs to combat poaching can be implemented on a national and local level. In 1978, Kenya's government closed the country's curio shops and banned all trade in wildlife products.<sup>112</sup> In light of the current and projected success of compensating local people for being displaced, it may be effective to compensate local people for abstaining from killing animals, as discussed above with respect to the Ubai-gubi forest. Additional educational and training programs, especially if they involve local people, would also help strengthen the effectiveness of an anti-poaching program.

The most successful program to combat poaching, however, would probably involve harsh financial penalties for poachers. The fines could be justifiably high in view of the large return poachers receive upon delivery of the trophies. The fines could be distributed in part as a reward for any person reporting poaching or poaching-related activity, and in part to increase the number of anti-poaching personnel in the nation's parks.

## VII. CONCLUSION

The success of both conservation and development depends upon the sustainable use of natural resources. When a government considers a decision between immediate economic benefits and long-term productivity of natural resources, however, the national interest groups favoring immediate economic benefits tend to be more powerful and more concentrated than international and national conservation groups. It is also difficult to persuade poor people, homeless people, and subsistence-level farmers to forego short-term benefits in favor of long-term benefits. In addition, the achievement of the goals of conservation depends largely upon a government's ability to implement effective land and social reform programs which will ease the burden on protected areas.

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<sup>105</sup> S. ELTRINGHAM, *supra* note 30, at 243.

<sup>106</sup> *Id.* at 244.

<sup>107</sup> *Id.*

<sup>108</sup> Holden, *Remember the Elephant*, SCIENCE, Sept. 12, 1980, at 1215.

<sup>109</sup> *Id.*

<sup>110</sup> WNPC, *supra* note 29, at Recommendations: Combatting Poaching.

<sup>111</sup> Fourth International Congress of the World Wildlife Fund, Dec. 1, 1976, Congress Resolutions: Destruction of Wildlife in East Africa.

<sup>112</sup> S. ELTRINGHAM, *supra* note 30, at 246.

For these reasons, international and national conservation efforts to integrate conservation with development will continue to face great challenges. The composition of the IUCN's membership, however, does show that there is global recognition of the significance of protecting natural resources. The rapid acceptance of the WCS and the NCS shows that governments are willing to implement joint conservation and development strategies. In light of these accomplishments and the great challenges ahead, current conservation efforts will require continued dedication and even greater innovative planning.

*William F. Brady*