Land Grant Colleges and Mechanization: A Need for Environmental Assessment

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The federal government's agriculture policies since the 1930's have stressed scientific and business efficiency, and have advanced corporate agri-business interests at the expense of the small farmer and farmworker.[1] The radical restructuring of rural life that has occurred[2] can be traced directly to federal

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1. *See generally* Abourezk, *Agriculture, Antitrust and Agribusiness: A Proposal for Federal Action*, 20 S.D. L. REV. 499 (1975); Clancy, January & Liddle, *Land Grant Colleges, Agribusiness and Migrant Farm Workers*, 2 TEX. S.U. L. REV. 236 (1972); Scher & Catz, *Farmworker Litigation Under the Fair Labor Standards Act: Establishing Joint Employer Liability and Related Problems*, 10 HARV. CIV. RIGHTS—CIV. LIB. L. REV. 575, 594-95 (1975); Scher, Catz, & Mathews, *USDA: Agriculture at the Expense of Small Farmers and Farmworkers*, 7 U. TOL. L. REV. 837 (1976); Comment, *Racial Discrimination in USDA Programs in the South: A Problem in Assuring the Integrity of the Welfare State*, 45 WASH. L. REV. 727 (1970).

2. Agricultural policies have forced many small farmers out of business. *See* Heady, *Externalities of American Agricultural Policy*, 7 U. TOL. L. REV. 795, 801-20 (1976); Scher, Catz, & Mathews, *supra* note 1, at 850-51. For example, between 1949 and 1969, the number of farms with annual sales below $10,000, when adjusted for inflation, declined from 4,750,000 to 1,898,000. W. COCHRANE & M. RYAN, AMERICAN FARM POLICY 1948-1973 10-11 (1976).

support for new technology that improves agricultural yields, namely mechanization.[3] The Department of Agriculture supports the development of mechanization by the land grant college system, which consists of state agricultural colleges, extension services, and experiment stations.

Although the land grant college system was designed to serve rural people,[4] it has concentrated on farm mechanization and failed to respond to the resulting displacement of small farmers and farmworkers. This displacement causes overcrowding of American cities and deterioration of farm communities. Ultimate responsibility for this policy that favors productivity and profits over long-term stability of people whose livelihood depends on the land, rests with the federal government.

This article suggests that the National Environmental Policy Act of 1969 (NEPA)[5] applies to agricultural research and development projects that receive federal monies through the land grant college system,[6] and that the Department of Agriculture has neglected its statutory duty to assess the long term environmental impact of a policy favoring mechanization. Compliance with NEPA will help the Department of Agriculture to meet its obligations to promote sound, prosperous agriculture and rural life,[7] and to consider the total environmental picture.[8]

The Land Grant College System

Congress first provided for federally funded agricultural research when it passed the Morrill Act in July of 1862.[9] This Act permitted donation of public lands to the states to establish colleges for the study of American agriculture.[10] Because these colleges were doing little research and ex-

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3. *See* notes 60-69 *infra* and accompanying text.

4. Clancy, *supra* note 1, at 237-44. *See generally Hearings on Appropriations Before the Subcomm. on Agriculture, Rural Development & Related Agencies of the House Comm. on Appropriations*, 95th Cong., 2d Sess. (1978).

5. 42 U.S.C. §§ 4321-4361 (1976), *as amended by* 42 U.S.C.A. §§ 4361a-4361c (West Supp. 1979).

6. National Environmental Policy Act of 1969, tit. I, § 102(2)(C), 42 U.S.C. § 4332(2)(C) (1976). *See generally* McGarity, *The Courts, the Agencies, and NEPA Threshold Issues*, 55 TEX. L. REV. 801 (1977); *see also* Hanks & Hanks, *An Environmental Bill of Rights: The Citizen Suit and the National Environmental Policy Act of 1969*, 24 RUTGERS L. REV. 230 (1970).

7. 7 U.S.C. § 427 (1976).

8. 42 U.S.C. § 4331 (1976). For a discussion of the extreme working conditions of farmworkers, see Comment, *Farmworkers in Jeopardy: OSHA, EPA, and the Pesticide Hazard*, 5 ECOLOGY L.Q. 69 (1975).

9. Ch. 130, 12 Stat. 503 (1862) (current version at 7 U.S.C. §§ 301-349 (1976)).

10. 7 U.S.C. § 301 (1976). Each of the land grant colleges established by the Morrill Act set up departments for the teaching and study of agriculture as an academic discipline. *See generally* E. EDDY, COLLEGES FOR OUR LAND & OUR TIME: THE LAND GRANT IDEA IN AMERICA (1957); Clancy, *supra* note 1, at 238-41.

Because blacks were excluded from the land grant colleges Congress passed in 1890 a second Morrill Act, ch. 841, 26 Stat. 417 (current version at 7 U.S.C.

perimentation, Congress passed the Hatch Act[11] in 1887 to stimulate agricultural research. The Hatch Act created a nationwide system of state agricultural experiment stations to conduct agricultural research.[12] It provided for at least one station in each state or territory associated with a state land grant college.[13] Most federally supported agricultural research is still conducted at these stations.[14]

Federal funding of experiment stations has increased substantially over the years, indicating an increasing federal commitment to agricultural research.[15] Initially, funds were derived from the sale of public lands donated for that purpose by the federal government.[16] The Hatch Act of 1887 provided tax support for the experiment stations, and authorized them to conduct original research and to disseminate present knowledge.[17] Congress attempted to resolve the confusion about which of these two responsibilities should constitute the primary role of the experiment stations[18] by passing the Adams Act, which provided additional funds to the stations, but only for expenses of original research.[19] The dissemination role was assigned to the Department of Agricultural Cooperative Extension Service under the Smith-Lever Agricultural Extension Act of 1914.[20]

Congress expanded experiment station research into another area when it passed the Purnell Act of 1925.[21] This Act created a federal endowment for scientific research at the agricultural experiment stations.[22] It also earmarked funds for the study of economic problems of agriculture and socioeconomic development of rural home life.[23]

Recognizing that agricultural problems often traverse state lines, Congress has encouraged the development of cooperative regional research. It enacted the Bankhead-Jones Act of 1935,[24] which provided federal funds for the cre-

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§§ 321-326, 328 (1976)), which provided land grant support to existing black colleges and led to the establishment of other black colleges. Thus, the black institutions are often referred to as "1890 institutions."

11. Ch. 314, 24 Stat. 440 (1887) (current version at 7 U.S.C. §§ 361a-361i (1976)).

12. Ch. 314, § 1, 24 Stat. 440 (1887) (current version at 7 U.S.C. § 361a (1976)).

13. *Id.*

14. H. KNOBLAUCH, E. LAW & W. MEYER, STATE AGRICULTURAL EXPERIMENT STATIONS—A HISTORY OF RESEARCH POLICY AND PROCEDURE 133-37 (1962). *See also* J. HIGHTOWER, HARD TOMATOES, HARD TIMES 25 (1973).

15. U.S. DEPARTMENT OF AGRICULTURE, THE YEARBOOK OF AGRICULTURE 235 (1975).

16. The amount of land donated to each state was based on an amount equal to thirty thousand acres for each Senator and Representative in Congress under the census of 1860. 7 U.S.C. § 301 (1976). *See also* Clancy, *supra* note 1, at 240.

17. Ch. 314, § 1, 24 Stat. 440 (1887) (current version at 7 U.S.C. § 361a (1976)).

18. *See* 40 CONG. REC. 2615-27 (1906).

19. Adams Act of 1906, ch. 951, § 1, 34 Stat. 63 (current version at 7 U.S.C. §§ 361c-361e, 361g, 361i (1976)).

20. Ch. 79, 38 Stat. 372 (1914) (current version at 7 U.S.C. §§ 341-349 (1976)).

21. Ch. 308, §§ 1-6, 43 Stat. 970 (current version at 7 U.S.C. §§ 361c-361e, 361g, 361i (1976)).

22. Ch. 308, § 1, 43 Stat. 970 (current version at 7 U.S.C. § 361c (1976)).

23. *Id.*

24. Ch. 338, §§ 1-8, 49 Stat. 436 (1935) (current version at 7 U.S.C. §§ 361a-361c, 427 (1976)).

ation of regional research laboratories. A 1946 amendment to the Act provided additional funds for cooperative extension work and research on human nutrition and marketing.[25] In 1955, Congress established the Regional Research Fund to support agricultural research projects involving experiment stations from two or more states.[26] The purposes of this fund were to stimulate cooperation between experiment stations and the Department of Agriculture, and among the stations themselves, to plan and coordinate research to avoid unnecessary duplication of effort, and to organize regional technical committees of state and federal representatives to plan and coordinate work on regional problems.[27]

The current statutory scheme for federally supported agricultural research consists of four consolidated statutes: the Hatch Act of 1955 as amended,[28] Public Law 89-106,[29] the Forestry Research Programs Act,[30] and title V of the Rural Development Act of 1972.[31] These statutes have recently been supplemented by the National Agricultural Research, Extension and Teaching Policy Act of 1977.[32]

By enacting the 1955 Hatch Act, Congress intended to consolidate prior statutes,[33] and to continue support for agricultural research.[34] The Act re-

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25. Ch. 966, tit. I, § 101, 60 Stat. 1082 (1946) (current version at 7 U.S.C. §§ 427, 427i (1976)). Cooperative extension work is defined as the giving of instructions and practical demonstrations in agriculture and home economics and subjects relating thereto to persons not attending or residing in college. 7 U.S.C. § 342 (1976).

26. 7 U.S.C. § 361(c)(3) (1976).

27. *See Hearings on H.R. 6548 and H.R. 6692 Before the House Comm. on Agriculture*, 79th Cong., 2d Sess., Serial M. 9-10 (1946).

28. 7 U.S.C. §§ 361a-361i (1976).

29. *Id.* § 450.

30. 16 U.S.C. §§ 582a-582a-7 (1976). The Forestry Research Programs Act of 1962 provided for the funding of forestry research through the land grant colleges and experimental stations. *Id.* § 582a-1.

31. 7 U.S.C. §§ 2661-2668 (1976).

32. 7 U.S.C.A. § 3101 (West Supp. 1979).

33. The Hatch Act of 1955, as amended, consolidates the Hatch Act of 1887, the Adams Act of 1906, the Purnell Act of 1925, the Bankhead-Jones Act of 1935, and title I of the Research and Marketing Act of 1946. *See* 7 U.S.C. § 361a (1976).

34. 7 U.S.C. § 361a (1976). The Act consolidates and simplifies the funding of agricultural experiment stations and cooperative state research. It reduces the number of operating funds from six to two; it preserves the requirement that states match dollar for dollar all federal subsidies to experimental stations in excess of $90,000; it retains the existing distribution of funds among the states; it removes the restrictions on the use of Adams Act funds for dissemination of research results; it limits land purchases or leases to five percent of Hatch funds; and it requires that 20% of appropriated funds be used for marketing research. *Id.* §§ 361a-361i. Thus, the 1955 Hatch Act makes virtually no changes in the agricultural research program. It merely streamlines the funding scheme for more efficient administration. *See* H.R. REP. NO. 1298, 84th Cong., 1st Sess. 44, *reprinted in* [1955] U.S. CODE CONG. & AD. NEWS 2976, 2976-77.

flects the need for a sound and prosperous agriculture, including the need for research on the development and improvement of rural life, and it assigns to the agricultural experiment stations the responsibility for garnering the knowledge that will support a sound and prosperous agriculture.[35] The Act authorizes federal funding of state experiment stations, but each federal dollar over $90,000 must be matched by a state dollar.[36] Hatch Act funds may also be used for indirect research costs like land acquisition, building construction, planning and administrative direction, and dissemination of research results.[37]

Public Law 89-106, passed in 1965,[38] enables the Department of Agriculture to make grants lasting up to five years for research that furthers the programs of the Department of Agriculture.[39] Those eligible to receive grants include not only the 1862 Morrill Act colleges and experiment stations, but also 1890 institutions,[40] and any other institution or individual.[41] Section 1414 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977[42] amends Public Law 89-106 and, in effect, sets up two grant programs: one for special grants and another for competitive grants.[43] The Department may award both kinds of grants regardless of other funds a college or experiment station may be receiving.

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35. 7 U.S.C. § 361b (1976).

36. *Id.* § 361c(d).

37. *Id.* § 361d. The National Agricultural Research, Extension, and Teaching Policy Act of 1977, 7 U.S.C.A. § 3101 (West Supp. 1979), amends the Hatch Act in two respects. It repeals the section of the Hatch Act that required experiment stations to spend at least 20% of Hatch funds on marketing research, 7 U.S.C. § 361c(C) (1976), and it permits use of administrative funds to pay transportation costs of scientists, other than federal employees, who attend research meetings. *Id.* § 361d (1976).

38. Pub. L. 89-106, § 2, 79 Stat. 431, 7 U.S.C. § 450i (1976).

39. *Id.*

40. *See* note 10 *supra*.

41. 7 U.S.C. § 450i (1976).

42. Pub. L. No. 95-113, § 1414, 91 Stat. 981, 7 U.S.C.A. § 450i (West Supp. 1979).

43. 7 U.S.C.A. § 450i (West Supp. 1979). The amended § 450i(b) provides: "The Secretary of Agriculture is authorized to make *competitive grants*, for periods not to exceed five years. . . ." *Id.* § 450i(b) (emphasis supplied). Section 450i(c) provides: "The Secretary of Agriculture is authorized to make *grants* for periods not to exceed five years in duration. . . ." *Id.* § 450i(c) (emphasis supplied). Furthermore, the amended § 450i provides competitive, special, and facilities grants for agricultural research. The purpose of the grant program is to "promote research in food, agriculture, and related areas" by making these grants available without regard to matching funds, for periods not exceeding five years. *Id.* § 450i(a)-(b).

Competitive grants are available to further existing Department of Agriculture high priority research programs and are available to "State agricultural experiment stations, all colleges and universities, other research institutions and organizations, Federal agencies, private organizations or corporations and individuals . . . ." *Id.* § 450i(b).

Special grants are available only to "land-grant colleges and universities, State agricultural experiment stations, and to all colleges and universities having a demonstrable capacity in food and agricultural research" and only for the purpose of carrying out research toward "promising breakthroughs" of national importance in agricultural science. *Id.* § 450i(c)(1).

Special grants are also available to "land-grant colleges and universities and State agricultural experiment stations" for the limited purpose of expanding existing state/

The Rural Development Act of 1972 was enacted[44] to support rural development research at land-grant colleges and public and private institutions.[45] The Act's purpose is to foster a balanced national development.[46] To accomplish this purpose it establishes four programs: Rural Development and Extension,[47] Rural Development Research,[48] Small Farm Research,[49] and Small Farm Extension.[50] The Act requires that its provisions be administered as one overall program in each state by one or more of the state's 1862 Morrill Act colleges,[51] though all colleges are eligible to participate in programs funded under the Act. The Rural Development Act of 1972 was designed "to provide an effective program to enable rural America to offer living conditions and employment opportunities adequate to impede the steady flow of rural Americans"[52] to our urban centers. The Act provides additional monies for construction of waste disposal and water systems,[53] rural housing loans, and rural community facilities.[54] The Act establishes new programs, like rural enterprise loans, small business operations,[55] in-

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federal research programs. 7 U.S.C. § 450i(c)(2) (1976).

Thus competitive grants are available to a larger group of possible grantees, including private individuals and corporations and Federal agencies, but the subject of the grant project must be one already established as high priority by the Department of Agriculture. Special grants, on the other hand, are available for a broader variety of experimental agricultural projects, but availability is limited to state-governmental grantees.

44. Pub. L. No. 92-419, tit. V, §§ 501-508, 86 Stat. 672 (1972) (current version at 7 U.S.C. §§ 2661, 2664-2666, 2668 (1976), 7 U.S.C.A. §§ 2662-2663, 2667, 2669-2670 (West Supp. 1979)).

45. 7 U.S.C. § 2661 (1976).

46. *Id.*

47. 7 U.S.C. § 2662(a) (1976). Rural Development and Extension programs are designed to collect, interpret, and disseminate agricultural research information useful to municipalities, planning districts, interested groups, Indian tribes, industries and federal agencies. These programs also include practical training for persons not enrolled in colleges. Feasibility studies may also be conducted under these programs. *Id.*

48. 7 U.S.C. § 2662(b) (1976). The Rural Development Research section of the Act funds scientific research and investigation that may develop information useful to government agencies and to industries located in rural areas. *Id.*

49. 7 U.S.C.A. § 2662(c) (West Supp. 1979). Small farm research consists of upgrading small farmer operations through technology, new products, and management techniques. 7 U.S.C. § 2662(c) (1976). *See also* GENERAL ACCOUNTING OFFICE, SOME PROBLEMS IMPEDING ECONOMIC IMPROVEMENT OF SMALL FARM OPERATIONS: WHAT THE DEPARTMENT OF AGRICULTURE COULD DO (Aug. 15, 1975).

50. 7 U.S.C.A. § 2662(d) (West Supp. 1979). Small farm extension consists of extension programs designed to use existing Department of Agriculture programs and para-professionals to help small farmers improve the operation of their farms. *Id.*; *see* GENERAL ACCOUNTING OFFICE, *supra* note 49, at 6-7.

51. *See* notes 9-10 *supra* and accompanying text.

52. H.R. REP. NO. 835, 92d Cong., 2d Sess. 1 (1972).

53. 7 U.S.C. § 1926(a)(2) (1976).

54. *Id.* § 1933.

55. *Id.* § 1924(b).

dustrialization,[56] and rural development planning, to meet the economic and social problems of rural areas. The Act reveals a clear congressional policy in favor of maintaining the small family farm as a way of life.

Since the passage of the Hatch Act of 1887, the commitment of federal dollars to agricultural research has increased steadily, making agricultural research a multi-million dollar enterprise. Federal payments for agricultural research under the Hatch Act totalled over $83,000,000 in 1976.[57] Appropriations for agricultural experiment stations under the Hatch Act increased from $120,000,000 in fiscal 1978 to over $145,000,000 in fiscal 1979.[58] The Congressional commitment to agricultural research will probably not wane in the near future because authorized appropriations for agricultural research programs have increased steadily through fiscal year 1981.[59]

Although most of the federally funded agricultural research is productive, the most productive aspect has been the development of mechanization,[60] which aids agri-business at the expense of the small farmer. Mechanization research ultimately develops efficient, but expensive, machinery. Agri-business has the capital to purchase these machines, which produce greater yields, greater profits, and greater investment capital for further mechanization. The small farmer, however, cannot afford this expensive machinery and his profits suffer accordingly. Thus, the federal subsidy for mechanization research has destroyed the competitive position of the small farmer, and forced him to sell his land.

In economic terms, mechanization is the substitution of capital for labor.[61] It reduces hand harvesting and other forms of manual farm labor, thereby reducing the demand for farmworkers. Because mechanization seldom eliminates all hand processes, the farmworker is still needed for some seasonal work, but he will usually fail to find other work to make up for the lost income.[62]

The detriments of unabated mechanization to the farmworker include under-employment, job displacement, and additional poverty. For example, in California, where agricultural wage rates during the last five years have risen 20% faster than in other states,[63] growers have mechanized even for

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56. *Id.* § 1932.

57. *See* COMMUNITY SERVICE ADMIN., FISCAL YEAR 1976 FEDERAL OUTLAYS REPORT.

58. *See* 7 U.S.C.A. § 3311(b) (West Supp. 1979).

59. Authorized appropriations under the Hatch Act to the agricultural experiment stations will increase to $170,000,000 in fiscal 1980, to $195,000,000 in fiscal 1981, and to $220,000,000 in fiscal 1982. 7 U.S.C.A. § 3311(b) (West Supp. 1979). Authorization for the competitive grants program, *see* notes 42-43 *supra* and accompanying text, will total $30,000,000 in fiscal 1979, $35,000,000 in fiscal 1980, and $40,000,000 in fiscal 1981. 7 U.S.C.A. § 450i (West Supp. 1979).

60. Plant scientists usually collaborate with an agricultural engineer in conducting mechanization research. This collaboration is particularly necessary in the area of fruit and vegetable harvesting because these crops are perishable and fragile.

61. *See* Clancy, *supra* note 1, at 244.

62. *Id.* at 244-59.

63. *The Latest Threat to Chavez: Mechanization,* BUS. WEEK, Jan. 30, 1978, at 69. Rising labor costs are attributable to the organized farm labor movement. In 1975, California enacted comprehensive farm labor legislation which provided for col-

traditionally hand-harvested crops, such as wine grapes, lettuce, and fresh market tomatoes. Studies indicate that labor displacement will increase, and that jobs contributing to the production of fruits and vegetables are particularly vulnerable.[64]

Job displacements occurring since the founding of the land grant colleges more than a century ago have caused substantial migrations from farms to cities.[65] These migrations have had a substantial impact on both the urban and rural environments. Cities have become overcrowded and suburbs have expanded, swallowing up farm land.[66] The populations of rural towns have either remained stable or decreased.[67] Rural economies have suffered because farmers have reduced their cultivated acreage or abandoned their farms.[68] Job opportunities have become more scarce, and many young people have been forced to leave their home towns.[69] The legacy of a national research policy favoring farm mechanization is a continuing slide toward more poverty and community disintegration in rural areas, more

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lective bargaining. *See* Levy, *The Agricultural Labor Relations Act of 1975—La Esperanza De California Para El Futuro*, 15 SANTA CLARA L. REV. 783, 788 (1975). *See also* Shatz, *Picketing Injunctions in California: A Study of the Role of the Courts in Farm Labor Disputes*, 28 HASTINGS L. J. 801 (1977); Note, *California's Attempt to End Farmworker Voicelessness: A Survey of the Agricultural Labor Relations Act of 1975*, 7 PAC. L.J. 197 (1976).

64. A California legislative research study estimates that 20,000 of the 112,000 harvest positions in ten major crops will disappear by 1982. BUS. WEEK, *supra* note 63, at 69. The present thrust of research is toward mechanizing production of fruits and vegetables. Scientists, engineers, and agri-businessmen at several experiment stations are presently developing new machines for harvesting cantaloupes, oranges, and strawberries. *Id. See also* Clancy, *supra* note 1, at 244-45; J. HIGHTOWER, *supra* note 14, at 29-40.

In northwest Ohio, an overwhelming shift by tomato growers to mechanical harvesting will result in 12,000 to 14,000 fewer jobs for farmworkers in the region during the 1979 tomato harvest. Statement of Dr. Bernie Erven, Professor of Rural Sociology, Ohio State University, to Ohio Governor's Committee on Migrant Labor (July 26, 1979), *reported in* Toledo Blade, July 26, 1979, at 3, col. 1. The shift to mechanization in northwest Ohio can be attributed to the policy of several large conglomerate food processors of only signing contracts with growers that utilize mechanical harvesting. Rose, *Risks in the Tomato Field: Union, Grower, Processor*, Toledo Blade, July 29, 1979, § C, at 1, col. 1. This policy raises significant antitrust issues because it affects the ability of small farmers who employ farmworkers in hand-harvest positions to sell their crops and compete in the marketplace.

65. J. HIGHTOWER, *supra* note 14, at 2-3. *See also* Morse, *The Impact of Federal Legislation on Migrant Farmworkers*, 12 SUFFOLK U.L. REV. 828, 844 (1978); Reno, Roisman & Shapiro, *Out in the Country: Legal Services and the Rural Poor*, 34 NLADA BRIEFCASE 70, 73 (1977).

66. Environmental Protection Agency Administrator Douglas Costle has recognized that suburbanization, which increases land prices, taxes, and labor costs, has driven many farmers off the land. *See* Costle, *The Role of Agriculture in the Environment*, 4 E.P.A.J. 1, 3 (1978).

67. J. HIGHTOWER, *supra* note 14, at 2-3. *But see* 7 COUNCIL ON ENVIRONMENTAL QUALITY ANN. REP. 286-307 (1976).

68. *But see* 7 COUNCIL ON ENVIRONMENTAL QUALITY ANN. REP. 286-307 (1976).

69. *But see id.*

abandoned farmsteads and houses which are susceptible to fire and vandalism, and more overcrowding of city tenements with attendant health, safety, and traffic problems.

The increased efficiency and productivity resulting from mechanization do not justify the social costs. The federal government has failed to assess the impacts of mechanization: wasted lives, worker relocation, and effects on both rural and urban life. Because the federal government subsidizes mechanization through the land grant college system, federal policy makers are ultimately responsible for the environmental effects and social problems caused by agricultural technology. If applicable, the National Environmental Policy Act of 1969[70] would require the Department of Agriculture to correct its failure to assess and respond to the environmental consequences of accelerated funding of mechanization research and development projects.[71]

Environmental Impact Statements and Mechanization Research

The National Environmental Policy Act of 1969 declares a broad national policy of using all practicable means to create and maintain conditions under which people and nature can exist in productive harmony.[72] Particular aims include:

> assur[ing] for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings; . . . attain[ing] the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences; . . . [and] achiev[ing] a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; . . . .[73]

The primary means of achieving these goals, the action-forcing provisions of section 102(2)(C), require federal agencies to prepare an Environmental Impact Statement (EIS) for "every recommendation or report on proposals for

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70. 42 U.S.C. §§ 4321-4361 (1976), *as amended by* 42 U.S.C.A. §§ 4361a-4361c (West Supp. 1979).

71. Recently, farmworker groups filed suit against the University of California alleging that the Board of Regents has permitted business corporations and its own economic interests to influence its decisions to spend public tax funds for agricultural mechanization. California Agrarian Action Project, Inc. v. The Regents of the Univ. of Cal., No. 516427-5 (Super. Ct., Alameda Cty., filed Jan. 17, 1979). The suit alleges violations of state conflict of interest laws, the Smith-Lever Act, 7 U.S.C. §§ 341-349 (1976), *as amended by* 7 U.S.C.A. §§ 341-343 (West Supp. 1979), and the Bankhead-Jones Act, 7 U.S.C. § 361a (1976). *See generally* Comment, *The Public Purpose Doctrine and University of California Farm Mechanization Research*, 11 U. CAL. D.L. REV. 599 (1978); Abascal, UC *Farm Research Plows Up Little Guys*, L.A. Times, Feb. 14, 1979, § III, at 5, col. 1.

72. National Environmental Policy Act of 1969, tit. I, § 101, 42 U.S.C. § 4321 (1976). *See generally* Hanks & Hanks, *supra* note 6; Peterson, *An Analysis of Title I of the National Environmental Policy Act of 1969*, 1 ENVIRON. L. REP. 50,035 (1971).

73. National Environmental Policy Act of 1969, tit. I, § 101(b)(2), (3), (5), 42 U.S.C. § 4331(b)(2), (3), (5) (1976).

legislation or other major Federal actions significantly affecting the quality of the human environment, ..."[74]

Congress failed to define many key words that govern the applicability of the EIS requirement. For example, the statute sheds little light on which actions are "major,"[75] "Federal,"[76] or "significantly affecting the . . . human environment."[77] Some definition has been given to the NEPA's ambiguities by guidelines[78] and regulations[79] prepared by the Council on Environmental Quality (CEQ),[80] and by the voluminous case law.[81]

The Department of Agriculture has never developed regulations integrating its administration of funds with the EIS process.[82] The Department has never filed an EIS on funding of any research topic, including mechanization.[83] The question to be explored is whether the Secretary of Agriculture must prepare an EIS on funding of agricultural research and development generally, and individual EIS's for particular projects. If EIS preparation is required, the proper scope of the EIS's and the proper procedure for developing them must be examined.

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74. *Id.*, tit. I, § 102(2)(c), 43 U.S.C. § 4332(c). *See generally* Note, *The Extraterritorial Scope of NEPA's Environmental Impact Statement Requirement*, 74 MICH. L. REV. 349 (1975).

75. *See* National Environmental Policy Act of 1969, tit. I, § 102(2)(c), 42 U.S.C. § 4332(2)(c) (1976). *See generally* Note, *Major Federal Actions Under the National Environmental Policy Act*, 44 FORDHAM L. REV. 580 (1975); Comment, *Environmental Law: What Is "Major" in "Major Federal Action?"*, 1975 WASH. U.L.Q. 485.

76. *See* National Environmental Policy Act of 1969, tit. I, § 102(2)(c), 42 U.S.C. § 4332(2)(c) (1976).

77. *See id.*

78. *See* 40 C.F.R. §§ 1500.1-.14 (1978). The role of the Council on Environmental Quality in assisting the process of definition and implementation was extended in 1973, pursuant to the President's authorization to the Council to issue guidelines for preparation of EIS's. Exec. Order No. 11,514, 3 C.F.R. 902 (1966-1970 compilation), *as amended by* Exec. Order No. 11,991, 3 C.F.R. 123 (1978). The guidelines first appeared in 38 Fed. Reg. 20,550 (1973) and are codified in 40 C.F.R. §§ 1500.1-.14 (1978). These guidelines are not regulations; they are intended to "assist" agencies in implementing NEPA. *See* 40 C.F.R. § 1500.1(a)-(b) (1978).

79. *See* 40 C.F.R. §§ 1508.1-.28 (1979); note 89 *infra*.

80. Authorization for the Council on Environmental Quality appears in the National Environmental Policy Act of 1969, tit. I, §§ 201-209, 42 U.S.C. §§ 4341-4347 (1976).

81. *See, e.g.*, notes 110-66 *infra* and accompanying text.

82. NEPA requires that all federal agencies review their present authority and report to the President any deficiencies or inconsistencies that prevent full compliance with the Act. National Environmental Policy Act of 1969, tit. I, § 103, 42 U.S.C. § 4333 (1976). July 1, 1971 was the deadline by which all agencies were required to propose changes that would permit them to comply with the intent, purpose, and procedures of NEPA. *Id.*

83. Telephone conversation with Chris Brown and Glen Loomis, Department of Agriculture, Office of Coordinator of Environmental Quality Activities, in Washington, D.C. (Jan. 3, 1979).

The Statutory Framework and CEQ's Regulations

Increased public awareness of ecological issues during the 1960's generated significant changes in the way the federal government makes decisions affecting the environment. In enacting NEPA, Congress recognized the profound environmental impact of factors such as population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances.[84] The statute requires federal agencies to consider environmental factors when making their decision.

When an agency like the Department of Agriculture develops and recommends a proposal for "major federal action" that will likely have a "significant" environmental impact, it must prepare an EIS.[85] Federal funding of agricultural research and development clearly is "major federal action" as the statute uses those terms.[86] The difficult question is whether this action "significantly affect[s] the quality of the human environment"[87] within the meaning of NEPA. The former guidelines[88] and present regulations[89] developed by the Council on Environmental Quality, which has been influential in the interpretation of NEPA,[90] answer this question affirmatively.

The regulations define "significantly,"[91] "effects,"[92] and "human environment."[93] They provide that the Act's EIS requirement is triggered by indirect effects, which expressly include changes in land use, population density, and growth rates.[94] Although economic or social effects alone are insufficient to require EIS preparation,[95] the regulations require that economic and social effects be discussed in an EIS triggered by the presence of natural or physical environmental effects.[96] Significance extends to both detrimental and beneficial effects, even when an agency concludes that the overall impact is beneficial.[97] Moreover, the regulations emphasize that a series of insignificant federal actions may cumulatively rise to the level of significance

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84. National Environmental Policy Act of 1969, tit. I, § 101(a), 42 U.S.C. § 4331(a) (1976). *See generally* Note, *Jetport: Stimulus for Solving New Problems in Environmental Control*, 23 U. FLA. L. REV. 376 (1971).

85. National Environmental Policy Act of 1969, tit. I, § 102(2)(c), 42 U.S.C. § 4332(2)(c) (1976).

86. *See id.*; notes 57-59 *supra* and accompanying text.

87. National Environmental Policy Act of 1969, tit. I, § 102(2)(c), 42 U.S.C. § 4332(2)(c) (1976).

88. 40 C.F.R. §§ 1500.1-.14 (1978); *see* note 78 *supra* and accompanying text.

89. The regulations originally published at 43 Fed. Reg. 55,978-56,007 (1978) are codified in 40 C.F.R. §§ 1500-1508 (1979).

90. *See* Andrus v. Sierra Club, 99 S. Ct. 2335, 2341 (1979) (holding that CEQ's interpretation of NEPA, as expressed in the regulations, is entitled to substantial deference). Some courts had accorded the guidelines the same weight as regulations. *See, e.g.*, Greene County Planning Bd. v. FPC, 455 F.2d 412, 421 (2d Cir.), *cert. denied*, 409 U.S. 849 (1972). Others, however, had not. *See* Sierra Club v. Lynn, 502 F.2d 43, 58 (5th Cir. 1974), *cert. denied*, 421 U.S. 994 (1975).

91. 40 C.F.R. § 1508.27 (1979).

92. *Id.* § 1508.8.

93. *Id.* § 1508.14.

94. *Id.* § 1508.8.

95. *Id.* § 1508.14. *See* notes 108-35 *infra* and accompanying text.

96. 40 C.F.R. § 1508.14 (1979).

97. *Id.* § 1508.27(b)(1).

requiring an EIS.[98] Consequently, the regulations require preparation of a broad program statement (programmatic EIS) to assess impacts that are generic or common to a series of agency actions.[99] Individual EIS's could thereafter assess particular impacts of an individual project that might have been inadequately covered by the programmatic statement.[100]

In addition, the regulations discuss the EIS requirement in relation to agencies conducting major technological research and development programs.[101] The regulations recognize that federally sponsored research may channel future technological development in a direction that forecloses other

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98. *Id.* § 1508.27(b)(7).

99. *Id.* § 1502.4.

100. *Id.* § 1502.20. Memorandum from the Council on Environmental Quality to Federal Agencies on Procedures for Improving Environmental Impact Statements, *reprinted in* 3 ENVIR. REP. (BNA) 82, 87 (1972), notes that the program statement has a number of advantages. It provides an occasion for a more exhaustive consideration of effects and alternatives than would be practicable in a statement on individual action. It ensures consideration of cumulative impacts that might be slighted in a case-by-case analysis, and it avoids duplication of consideration of policy questions.

101. *See* 40 C.F.R. § 1502.4(c)(3) (1979). This regulation urges agencies to evaluate proposals:

> By stage of technological development including federal or federally assisted research, development or demonstration programs for new technologies which, if applied, could significantly affect the quality of the human environment. Statements shall be prepared on such programs and shall be available before the program has reached a stage of investment or commitment to implementation likely to determine subsequent development or restrict later alternatives.

Id.

The Council on Environmental Quality's former guidelines identifed the following factors as determining when an EIS is appropriate for a research program:

> the magnitude of Federal investment in the program, the likelihood of widespread application of the technology, the degree of environmental impact which would occur if the technology were widely used, and the extent to which continued investment in the new technology is likely to restrict future alternatives.

40 C.F.R. § 1500.6(d)(2) (1978). Analysis of the federally sponsored agricultural research program in light of these factors strongly suggests that an EIS is required for the program and that EIS preparation should begin immediately. First, the magnitude of federal investment in the agricultural research program is great; millions of dollars have been spent for many years. The technology will definitely be widely applied; it generates the capital agri-business needs to make continuous investments. Wide application of the technology has a high degree of environmental impact; mechanization displaces farmers and farmworkers, resulting in demographic shifts and deterioration of both rural and urban communities. Moreover, continued investment in agricultural technology will restrict future alternatives; once new technology is introduced, private efforts are unlikely to replace it. Finally, migration from farms to other regions will be difficult to reverse, even if an alternative to the energy extravagant, machine-dependent agricultural system becomes necessary.

options.[102] If environmental values will be affected by this process, they must be evaluated through development of a programmatic EIS.[103]

Finally, the regulations direct agencies to prepare statements on actions commenced prior to NEPA's enactment "to the fullest extent possible."[104] Although the agricultural research program began long before NEPA was enacted and has subsequently received unstinted support from Congress and the Department of Agriculture, it would not be meaningless to require a programmatic EIS now. Support for mechanization is comprised of a myriad of individual decisions by the Secretary of Agriculture to fund particular projects each year. The planning and decision-making process is ongoing and NEPA requires agencies to reassess such ongoing programs to avoid or minimize adverse environmental effects.[105] Thus, the preexistence of the agricultural research program does not immunize it from the EIS requirement.

The Council on Environmental Quality's regulations thus support the conclusion that NEPA requires preparation of an environmental impact statement on the agricultural mechanization program. CEQ's regulations were recently given strong support by the Supreme Court. In the first case concerning NEPA since CEQ issued its regulations, the Court gave substantial deference to CEQ's interpretation of the Act's requirements.[106] Moreover, CEQ's interpretation of the relevant provisions of NEPA is consistent with recent judicial decisions.[107]

Judicial Interpretations

In determining the applicability of the EIS requirement, recent judicial decisions have focused on the scope of the phrase "human environment."[108] Some courts, relying on NEPA's broad language and intent, have concluded

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102. 40 C.F.R. § 1502.4(c)(3) (1979).

103. *Id. See generally* Comment, *The National Environmental Policy Act Applied to Policy-Level Decisionmaking*, 3 ECOLOGY L.Q. 799 (1973); Comment, *Planning Level and Program Impact Statements Under the National Environmental Policy Act: A Definitional Approach*, 23 U.C.L.A. L. REV. 124 (1975).

104. 40 C.F.R. § 1506.12(b) (1979).

105. *See* Scientists' Inst. for Pub. Info., Inc. v. AEC, 481 F.2d 1079, 1088-94 (D.C. Cir. 1973).

106. *See* Andrus v. Sierra Club, 99 S. Ct. 2335 (1979). The issue in *Andrus* was whether an EIS was required for appropriation requests submitted to Congress by federal agencies. *Id.* at 2336. The Court looked to CEQ's regulations, which reversed the former guideline's position that an EIS was required, and held that NEPA does not require an EIS for appropriation requests. *Id.* at 2345. Although noting that it was less inclined to defer to agency interpretation when the agency's present interpretation conflicts with an earlier pronouncement, the Court held that CEQ's regulations were entitled to substantial deference because CEQ was created by NEPA to review federal activities in light of, and advise the President on, the policies of the Act, and because CEQ's reversal occurred during a comprehensive process transforming advisory guidelines into mandatory regulations. *Id.* at 2341. In light of the deference the Court accorded CEQ's interpretation of NEPA on the one issue on which the Council reversed itself, the other provisions of the regulations, on which CEQ's interpretation has remained consistent, should be accorded similar deference.

107. *See* notes 108-36 *infra* and accompanying text.

108. National Environmental Policy Act of 1969, tit. I, § 102(2)(c), 42 U.S.C. § 4332(c) (1976).

that social and economic impacts of sufficient magnitude would trigger the EIS requirement.[109] Most courts, however, have held that NEPA requires consideration of socio-economic effects only when there is a primary impact on the physical environment.[110] If a "physical impact" is present, an EIS is necessary and any socio-economic impacts must also be evaluated.[111]

The physical impact rule can be interpreted broadly or narrowly. In *Breckenridge v. Rumsfeld*,[112] the court held that the closing of an army base and transfer of its personnel and functions did not require preparation of an EIS.[113] The court reasoned that the closing did not degrade traditional environmental assets and only short-term inconvenience and economic disruptions were alleged.[114] In the absence of a primary impact on the physical environment, the court refused to require an EIS.[115]

Litigants can avoid such narrow applications of the physical impact rule by proper pleading of the particular physical impacts of the proposed action as *McDowell v. Schlesinger*[116] and *Jackson County v. Jones*[117] illustrate. In

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109. *E.g.*, Prince George's County v. Holloway, 404 F. Supp. 1181 (D.D.C. 1975). At least one agency regulation has defined "environment" to include the natural, sound, and economic environment. *See* 39 Fed. Reg. 38244, 38252 (1974) (U.S. Forest Service).

110. *See, e.g.*, Image of Greater San Antonio v. Brown, 570 F.2d 517, 522 (5th Cir. 1978) (no allegation of physical environmental impact in reduction of civilian personnel by 1200 at Air Force base, thus no EIS was required); City of Rochester v. United States Postal Service, 541 F.2d 967, 973 (2d Cir. 1976) (post office moved 1400 employees and facilities to suburbs and thus the court held that an EIS was required because of the increase in commuter traffic and the loss of inner city jobs, resulting in the deterioration of the downtown area); Breckenridge v. Rumsfeld, 537 F.2d 864, 867 (6th Cir. 1976), *cert. denied*, 429 U.S. 1061 (1977) (EIS was required though Army issued negative declaration for closing part of army depot involving 2600 jobs and transfer of functions to other state); Maryland Nat'l Capital Park and Planning Comm. v. Martin, 447 F. Supp. 350, 352-53 (D.D.C. 1978) (no significant impact or major federal action when 600-700 people were transferred to facility a mile away); Township of Dover v. United States Postal Service, 429 F. Supp. 295, 297 (D.N.J. 1977) (no EIS was required for transfer of post office functions to new facility because the impact was only social and economic); Metlakatla Indian Community v. Adams, 427 F. Supp. 871, 874-75 (D.D.C. 1977) (no EIS was required because of the lack of detrimental physical impact of Coast Guard's removal of housing units from an island, despite the creation of a housing shortage for the Indian community); National Ass'n of Gov't Employees v. Rumsfeld, 413 F. Supp. 1224, 1226 (D.D.C. 1976), *aff'd without opinion*, 556 F.2d 76 (D.C. Cir. 1977) (transfer of military operations did not require an EIS because the impact was only socio-economic or secondary).

111. Image of Greater San Antonio v. Brown, 570 F.2d 517, 522 (5th Cir. 1978).

112. 537 F.2d 864 (6th Cir. 1976), *cert. denied*, 429 U.S. 1061 (1977).

113. 537 F.2d at 865-66.

114. *Id.* at 865.

115. *Id.*

116. 404 F. Supp. 221 (W.D. Mo. 1975).

117. 571 F.2d 1004 (8th Cir. 1978).

McDowell, the court enjoined Air Force plans to relocate 7,500 personnel from Missouri to Illinois pending preparation of an EIS. In holding that the Air Force's decision not to prepare an EIS was unreasonable,[118] the court examined numerous factors which it characterized as "secondary effects": dislocation in the local economy,[119] reduction in tax base of the city from which the transfers were to be made,[120] the tax consequences of a large number of empty houses (in an area of low demand),[121] fears of vandalism and fire hazard,[122] the uncertainty of sufficient housing in the new location,[123] the impact of loss of so many students on the town's school system,[124] and the impact on public services like public utilities and education in the new area.[125] The court found that the relocation would have a significant impact on the environment and required preparation of an EIS.[126]

The view that "secondary impacts" require preparation of an EIS even in the absence of a primary "physical impact" is not shared by most courts. Nevertheless, the importance of socio-economic impacts, however characterized, is indicated by the broad language of NEPA. Congress recognized that population growth, urbanization, and industrial expansion have a "profound" impact[127] and enacted NEPA to fulfill social, economic, and other requirements of present and future generations.[128] Indeed, the court in *Jackson County*,[129] to enforce the EIS requirement, construed as "physical" the same impacts that the *McDowell* court has called "secondary." After the EIS required by *McDowell* was completed, it was challenged as insufficient in *Jackson County*. Although it upheld the physical impact requirement,[130] the *Jackson County* court showed that one court's secondary impacts could be another court's physical impacts.[131]

Thus, the degree of physical impact needed before an EIS will be required varies from case to case.[132] Congress' directive to implement NEPA "to the fullest extent possible"[133] should be read to mandate a low threshold test for "significance."[134] In doubtful cases, agencies should err in favor of the environment and apply the EIS process.

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118. 404 F. Supp. at 251.
119. *Id.* at 235-36.
120. *Id.* at 236.
121. *Id.* at 236-37.
122. *Id.* at 237.
123. *Id.* at 237-38.
124. *Id.* at 237.
125. *Id.* at 238-39.
126. *Id.* at 254-55.
127. National Environmental Policy Act of 1969, tit. I, § 101(a), 42 U.S.C. § 4331(a) (1976).
128. *Id.* tit. I, § 101, 42 U.S.C. § 4331 (1976).
129. 571 F.2d 1004, 1007 (8th Cir. 1978).
130. *Id.* at 1007.
131. *Id.*
132. *See* note 110 *supra*.
133. National Environmental Policy Act of 1969, tit. I, § 102, 42 U.S.C. § 4332 (1976).
134. Chalker & Catz, *A Case Analysis of NEPA Implementation: NIH and DNA Recombinant Research*, 1978 DUKE L.J. 57, 75.

Recent decisions thus provide a precise tool to determine whether federally supported mechanization research significantly affects the human environment within the meaning of NEPA. Physical effects are definitely present in the form of continuing urbanization and rural deterioration. The potential physical effects of particular projects vary. For example, the engineering parameters of a newly-developed farm machine may require genetic alteration of the crop on which it operates.[135] The new genotype may, in turn, require application of particular quantities and types of pesticides and fertilizers. Such chemicals may affect the environment of an area quite significantly. Whether sufficient physical impact is present to require a programmatic EIS must be evaluated on a case-by-case basis using the agency's expertise.[136]

NEPA's declaration of policy recognizes that new technology can have a profound effect on the environment.[137] The first federal agency to apply this insight was probably the National Institute of Health, which decided to issue an EIS on its guidelines governing recombinant DNA research.[138] In a recent case,[139] the United States District Court for the District of Columbia refused to enjoin funding of the National Institute's DNA research because the EIS prepared on the project represented a "hard look" by the agency at the possible environmental effects.[140]

Only a few other cases have addressed the question whether a developing technology should be evaluated by an EIS. In *Scientists' Institute for Public Information, Inc. v. Atomic Energy Commission*[141] (hereinafter *SIPI*) the United States Court of Appeals for the District of Columbia Circuit held that the Atomic Energy Commission must prepare to evaluate the environmental consequences of its program developing the fast breeder reactor.[142] The

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135. The "hard tomato" is the best example of a plant genetically altered to withstand harvesting by a machine. Genetically designed apple trees that grow shorter than natural apple trees to facilitate machine picking were also developed by land grant college research. J. HIGHTOWER, *supra* note 14, at 30.

136. 40 C.F.R. § 1501.4 (1979).

137. National Environmental Policy Act of 1969, tit. I, § 101(a), 42 U.S.C. § 4331(a) (1976). *See generally* Gelpe & Tarlock, *The Uses of Scientific Information in Environmental Decisionmaking*, 48 S. CAL. L. REV. 371 (1974).

138. Chalker & Catz, *supra* note 134, at 61 n.20. NIH's first halting move was inadequate in several respects. The EIS was filed after issuance of the guidelines, and it addressed only the guidelines and not the program of support itself. Some of the deficiencies in the EIS are, however, being remedied. *Id.* at 79 n.110, 81 n.119.

139. Mack v. Califano, 447 F. Supp. 668 (D.D.C. 1978). *See also* Chalker & Catz, *supra* note 134; Symposium, *Biotechnology and the Law: Recombinant DNA and the Control of Scientific Research*, 51 S. CAL. L. REV. 969 (1978).

140. 447 F. Supp. at 670.

141. 481 F.2d 1079 (D.C. Cir. 1973).

142. *Id.* at 1082. *See generally* Golub, *NEPA Evaluation of Technological Research and Development Programs*, 8 URB. L. ANN. 253 (1974); Parenteau & Catz, *Public Assessment of Biological Technologies: Can NEPA Answer the Challenge?*, 64 GEO. L.J. 679, 688-94 (1976).

court recognized that NEPA applies not only when an agency proposes to do something itself, "but also whenever an agency makes a decision which permits action by other parties which will affect the quality of the environment."[143] The projected expenditure on fast breeder research, more than two billion dollars by 1986, would permit future commercialization of the process, so the court concluded that an EIS should address such plans.[144]

Courts often allow federal agencies to determine how to implement the EIS requirement in particular situations.[145] Agency expertise is often deferred to, but it is not sacrosanct. In *Natural Resources Defense Council, Inc. v. Hodel*,[146] the court ordered preparation of a programmatic statement because it found inadequate the preparation of only individual EIS's when a regional power plant development plan was being implemented.[147] When initial applicability of the EIS process is apparent, the courts assess the reasonableness of an agency's decision either to develop or not to develop a programmatic EIS.[148] Once a programmatic EIS is developed, the courts review its adequacy.[149]

The United States Court of Appeals for the Second Circuit addressed the question of EIS applicability to technological development in *Natural Resources Defense Council, Inc. v. Nuclear Regulatory Commission*.[150] The court held that a Commission order permitting interim licensing for use of mixed oxide fuels by nuclear power plants was a major federal action with significant environmental impacts, requiring both an individual and programmatic EIS.[151] Prior to the litigation, the Commission had recognized the need for a programmatic EIS on the use of mixed oxide fuels, a new technological development which had not yet gone into commercial use.[152] It was in the process of completing the programmatic EIS when it issued the contested order. This case indicates that an agency must complete a pro-

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SIPI addressed also the question of when an EIS should be prepared for a technological development program. The Court of Appeals proposed a four part test for determining timeliness, 481 F.2d at 1094, and decided that the time was ripe for the Commission to prepare an EIS on the breeder reactor program. Although the Supreme Court later struck down the four part test, Kleppe v. Sierra Club, 427 U.S. 390, 404-06 (1976), SIPI remains good authority for the applicability of a programmatic EIS requirement to research and development programs.

143. 481 F.2d at 1088.

144. Golub, *supra* note 142, at 253, 256.

145. *See, e.g.*, Conservation Law Foundation v. GSA, 427 F. Supp. 1369, 1374 (D.R.I. 1977) (reasonable for Dept. of Defense and GSA to exclude particular parcel of land from regional disposition plan, given different characteristics of parcel).

146. 453 F. Supp. 590 (D. Ore. 1977).

147. *Id.* at 590-91.

148. Environmental Defense Fund v. Adams, 434 F. Supp. 403, 407 (D.D.C. 1977) (Secretary of Transportation was required to develop programmatic EIS for nationwide airport development law); Conservation Law Foundation v. GSA, 427 F. Supp. 1369, 1377 (D.R.I. 1977).

149. Natural Resources Defense Council, Inc. v. Energy Research and Dev. Admin., 451 F. Supp. 1245, 1266 (D.D.C. 1978) (two programmatic EIS's for short term nuclear waste storage were adequate, but individual EIS's were required because the programmatic EIS's failed to cover all the relevant factors).

150. 539 F.2d 824 (2d Cir. 1976), *vacated and remanded*, 434 U.S. 1030 (1978).

151. *Id.* at 844-45.

152. *Id.* at 832.

grammatic EIS before any implementation of a new technology is permissible.[153] The rationale for this rule is that an extensive commitment of resources before completion of the EIS is likely to slant the ultimate decision toward proceeding to full implementation.[154]

The relationship between programmatic and individual EIS's has received the Supreme Court's attention. In *Kleppe v. Sierra Club*,[155] the Court held that NEPA does not require preparation of an EIS for coal leasing on federal lands in the midwest, absent an agency proposal for regional coal development.[156] Environmental groups brought this suit against the Department of Interior and other agencies responsible for issuing coal leases and other permits necessary for developing coal reserves on federal land. Plaintiffs contended that a *de facto* plan for regional coal development existed, and that the Government must therefore prepare a regional EIS before it approved individual leases.[157] Although recognizing that the Department had previously issued a nationwide EIS when it developed the planning system for a national coal leasing program,[158] and that several studies treated the relevant geographic area as one subject of inquiry,[159] the Court rejected plaintiffs' contention on the ground that no regional proposal for development existed.[160] In the Court's view, NEPA requires the existence of an explicit proposal before the EIS requirement will apply.[161]

In *Kleppe*, the lower court had enjoined agency approval of four mining plans in the region.[162] The Supreme Court noted, however, that even if a regional EIS had been required, the lower court erred in enjoining the four mining plans without determining first that the individual EIS's were inadequate.[163] The Court also rejected the necessity of completing a comprehensive EIS before approving individual projects. Rather, an agency could approve a project covered by an individual EIS, and then consider the environmental effects of that project when preparing the comprehensive EIS on the cumulative impact of the remaining proposals.[164]

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153. The Supreme Court vacated the judgment of the Court of Appeals and remanded for consideration of mootness. 434 U.S. 1030 (1978). Apparently, the reason for that disposition was the subsequent completion of the programmatic EIS by the Commission.

154. 539 F.2d at 844-45 (citing Scientists' Inst. for Pub. Info., Inc. v. AEC, 481 F.2d 1079, 1093-94 (D.C. Cir. 1973)).

155. 427 U.S. 390 (1976).

156. *Id.* at 402.

157. *Id.* at 400-02.

158. *Id.* at 398.

159. *Id.* at 400.

160. *Id.* at 400-02.

161. *Id.* at 407-08.

162. Kleppe v. Sierra Club, 509 F.2d 533, 534 (D.C. Cir. 1975). EIS's had been prepared for the projects, but were not before the District Court or the Court of Appeals. 427 U.S. at 395.

163. 427 U.S. at 407 n.16.

164. *Id.* at 414 n.26.

Problems encountered by agencies attempting to apply the *Kleppe* decision to their actions led the Council on Environmental Quality to address an explanatory memo to executive agencies:

> The holding, according to the CEQ, requires the application of a three-part test. Before an agency may allow interim action to proceed, it must: (1) find no significant interdependence between the individual action and the other action to be covered in the comprehensive EIS, (2) prepare an adequate individual EIS for the interim actions, and (3) make a commitment to analyze the action's cumulative effects in the forthcoming comprehensive statement. [165]

Thus, only in these limited circumstances may individual project proposals be approved before the programmatic EIS is completed. The Act's requirements on EIS content, however, remain in full effect for such interim projects. [166]

The cases leave little doubt that NEPA's EIS requirement applies to federal sponsorship of mechanization research. The federal government's large investment in agricultural research is, as in *SIPI*, intended to result in commercialization and widespread use of the new technology. [167] Although the government supported mechanization research may or may not have a significant environmental impact in and of itself, that support will permit others in the future to apply the technology and thereby affect the environment.

Mechanization research as a generic category has been of long-standing interest to the Department of Agriculture and has a significant impact on the environment. [168] The immediate impacts of a particular project of mechanization, such as the development of a tomato picker, may be confined to the communities in which the particular machine is used. The cumulative impact of mechanizing every branch of agriculture, however, cannot be adequately assessed in each individual EIS. Although the Department has some discretion in assessing the environmental impacts of its research support, [169] failure to prepare a programmatic EIS on mechanization is unreasonable.

The question thus becomes whether the Department of Agriculture may continue its current research programs while developing a programmatic EIS. In *Kleppe*, the Supreme Court indicated in dictum that in resource development situations, individual projects may go forward pending preparation of a comprehensive EIS. [170] *Kleppe*, however, addressed the development of natural resources, not new technology. The Council on Environmental Quality suggests that the inquiry should begin with the following

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165. F. GRAD, 2 TREATISE ON ENVIRONMENTAL LAW § 9.02 (1978).

166. *Id.*

167. *See* notes 141-44 *supra* and accompanying text.

168. Government supported mechanization affects the environment by the transformation of American agriculture into a capital intensive industry, creating rural refugees, abandoned communities, urbanization, and unemployment. Heady, *supra* note 2, at 810-20. *See generally* J. HIGHTOWER, *supra* note 14.

169. *See* note 137 *supra* and accompanying text.

170. 427 U.S. at 414 & n.26.

question: Is there a significant interdependence between the individual action and the other action covered in the comprehensive EIS?[171] If there is significant interdependence, then interim action is impermissible. In the Department of Agriculture's situation, this means inquiring into the relation between a particular mechanical development and the overall impacts of mechanization.

Given the massive size of the mechanization program and the great variety of tasks that it addresses, probably only some individual projects would be significantly interdependent with the overall mechanization program. Generally speaking, impacts of particular projects are incremental. If in a particular case the Department of Agriculture finds no significant interdependence, to allow interim action it must prepare an adequate individual EIS for the interim project and commit itself to analyze the action's cumulative effects in the forthcoming comprehensive statement.[172] Thus, for any individual projects, continued on an interim basis, the Department would have to prepare an individual EIS, and include in the programmatic EIS an assessment of cumulative impacts of the individual projects continued on an interim basis.

Conclusion

The small farmer and migrant farmworker represent the clearest example of a segment of American society adversely affected by the policies of the federal government. The Department of Agriculture, through the land-grant college complex and agri-business, has by a policy of mechanization research and development caused the elimination of thousands of jobs and reduced the ability of the small farmer to compete effectively in the marketplace.

The policy of mechanization has had a deleterious effect on the quality of life in rural America. Although a complete return to the small farming operation is neither possible nor desirable, the federal government and its agricultural policy-makers must be required to assess the environmental impact of a continued policy of mechanization in terms of the ultimate social and economic costs on America. The National Environmental Policy Act of 1969, in the absence of other legislation, may provide the only vehicle to assure that agricultural policy-makers consider the implications of mechanization. The CEQ guidelines, relevant decisions, and recent CEQ regulations support the applicability of NEPA's EIS requirement to the Department of Agriculture, which has thus far failed to comply with even the most basic NEPA requirements for research programs. No formal procedures appear in the Department's regulations for determining which programs or projects

171. *See* note 165 *supra* and accompanying text.
172. 40 C.F.R. § 1506.1 (1979).

might require EIS's, or for determining just how NEPA compliance is to be organized. Although case law has supported the application of NEPA to new technologies for at least five years, the Department has not filed one EIS on any research program or project. Such flagrant disregard for the clear requirements of the law seriously undermines NEPA's ability to anticipate and control potential environmental problems. Perhaps the advent of CEQ's mandatory regulations will spur the Department of Agriculture into compliance with NEPA.