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Within the region from New York to Virginia are many rural areas where the natural environment has been destroyed. State, Federal and local funds have been made available to aid in future planning and development designed to protect and conserve the natural resources and environment of these areas. The conclusions and recommendations reported were the result of open-ended interviews with resident planning staffs, planning consultants, state planning administrators, state and Federal agency administrators, university administrators and faculty, farm organization officials, and farm and forest landowners. The interviews were structured around the following objectives of inquiry: (1) effectiveness of planning for urban development in rural areas; (2) natural resource relationships to comprehensive development planning; (3) land-grant university natural resource planning and development curriculums and research programs; and (4) state administration and supervision of the local "701 Planning Assistance Program" matching funds. While some objectives were being met, more cooperative planning and funding will be necessary to fully implement resource allocation and development. (DK)

Urban Planning in Rural America

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Washington, D.C. 20410

Urban Planning in Rural America

. . . A STUDY

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This study, aided by a Federal "701" urban planning assistance grant, was conducted in 1964-1965 for the Pennsylvania State University, the Pennsylvania Department of Commerce, and the U. S. Department of Housing and Urban Development.

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CONTENTS

AN INQUIRY OF PLANNING FOR URBAN DEVELOPMENT IN RURAL AREAS

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* Design of the inquiry and the report was developed with the counsel of the advisory committee. Authors are solely responsible for conclusions and recommendations which are based on personal reflections drawn from limited observation of about 300 interview contacts in 1964-65. The Report benefited from numerous review comments and suggestions.

AREA AND INTERVIEWS

Personal Interviews Were Conducted in the States of:

Delaware

Maryland

New Jersey

New York

Pennsylvania

Virginia

Summary of Interviews:

	Number
Resident County Planners	87
Planning Consultants	24
State Planning Administrators	20
Related State and Federal Agencies	34
University Administrators and Faculty	40
Farm Organization Officials	18
Landowners - Farm and Forest	80
Total	303

Informal discussions were held with certain selected individuals from outside the 6-state region.

RECOMMENDATIONS

1. Effectiveness of planning for urban development in rural areas

A program of state planning assistance funds for groups of predominantly rural counties that establish and maintain resident planning staffs would help strengthen long-run citizen support for comprehensive planning in rural areas. The state matching fund would be in addition to the federal "701" planning assistance program. Its use would be prohibited for planning consultant fees.

County or regional resident staffs could strengthen and add depth to their planning programs by supplementing resident staff competency through specialized consulting contracts.

Whether the relationship of the resident rural county planner should be in an advisory capacity or be in a staff position to county government needs further exploration and consideration in attempts to strengthen the continuing rural planning programs and implementation as an essential function of government.

Much additional study is needed on the use of capital facilities budgeting as a major plan effectuation instrument along with land use controls to guide resource development in rural areas.

2. Natural resource relationships of comprehensive development planning

Planning for urban development in rural areas and accommodating urban pressures on natural resources must consider the total natural environment.

If ecological considerations and the integrity of the natural environment are accepted as planning objectives, then coordination of federal, state, and local planning programs should be mandatory.

Consideration should be given to the use of economic or "purse-string power" methods to make comprehensive development planning truly comprehensive by including more complete natural resource analysis and interpretation.

3. Land-grant university natural resource planning and development curriculums and research programs

Land-grant universities could and should move more aggressively to respond to the research and educational challenge implied in society's concern for natural environment planning.

4. State administration and supervision of the "701" local planning assistance matching funds

Additional study of the effectiveness of various combinations of state administration and supervision is needed. Additional study is required to adequately measure the significance of the unique combination of human, natural and institutional resources represented in the region. The study should evaluate planning administration and supervision in term of monetary cost and citizen satisfaction.

State administrative and supervisory staffs should be of sufficient size and quality to expedite the processing of project applications and the flow of project funds to approved projects.

The length of project contract periods should be flexible. It should be related to the availability of qualified professional planning assistance.

When planning consultants request it and procedures are outlined, funds and time should be made available to conduct educational meetings to inform local citizens about the specific contribution the consultants have contracted to make to the comprehensive plan.

Universities should not contract directly with communities to prepare comprehensive plans.

OBJECTIVES

Rural beliefs and values have been the chief guides in forming rural attitudes about the effectiveness of planning for urban development in rural areas. The "work ethic," the "democratic creed," and the "enterprise creed," have been deeply rooted in rural America. The objectives, conclusions and recommendations include recognition of the difficulty of measuring citizen satisfaction of the effectiveness of plan development and plan implementation in the face of large scale migrations to and from rural areas. Changing patterns of work and residence have also led to changing rural beliefs and values.

In rural areas there is deep felt commitment to hard work and superior industry as well as the belief that all men are of equal dignity and worth and that no man is good or wise enough to have arbitrary power over any other. These values coupled with the feeling that proprietors deserve exclusive right to prescribe the working rules of their productive units have caused considerable rural resistance in the past to plan development and implementation.

Interviews with resident planning staffs, planning consultants, state planning administrators, state and federal agency administrators, university administrators and faculty, farm organization officials, and farm and forest landowners served as the basis for conclusions and recommendations regarding the following objectives of the inquiry:

1. Effectiveness of planning for urban development in rural areas.
2. Natural resource relationships of comprehensive development planning.
3. Land-grant university natural resource planning and development curriculums and research programs.
4. State administration and supervision of the "701" local planning assistance matching funds.

METHOD

It is not possible to know what would have been in the region in absence of formal planning for urban development in rural areas and the "701 Planning Assistance Program." Conclusions and recommendations are based on the authors' interpretation of citizen interest, support and satisfaction with local resource use planning. Confidential interview discussions with professional planners, educators, state and federal agency staffs, and community leaders in the region provided insights regarding values, attitudes, goals, frustrations, and satisfactions.

Judgments relating to the effectiveness of planning in rural areas also reflect the authors' training and experience in discussing resource use planning with residents of the Commonwealth of Pennsylvania during the past decade. Individual interview discussions to test national sentiment also were held in Texas, Alabama, Illinois, Ohio, Massachusetts and Wisconsin.

No attempt was made to determine the extent of the total numbers of people or agencies involved in the planning process in the region. The dynamic nature of the planning effort and the mobility of those involved contributed to make a population determination beyond the scope of this inquiry.

Interviews were conducted in all parts of the region and those contacted appeared to be eager to share their ideas regarding planning. Several commented that this inquiry was their initial opportunity to express their thoughts regarding the effectiveness of the "701 Program."

The authors were the only interviewers involved and each person

was asked similar questions but the questions were open-ended. Selection of interviews and responses to questions were not controlled and all individual responses were considered confidential.

Wide differences of length of time in the planning process and in the administration and supervision of the "701 Program" removed all possibilities of comparability of responses except for the authors' judgment of citizen satisfaction and support for the planning process.

The complex interrelationships of human, natural and institutional resources coupled with varying beliefs, values, and attitudes do not lend themselves to quantitative systematic measurement. But based on an interpretation of confidential expressions of satisfaction and frustration with plan development and implementation, it is the authors' judgment that citizen consensus indicates that planning for urban development in rural areas and the "701 Program" have proven to be effective, flexible, and adaptable. Also, there is citizen support for the continued investment of federal, state and local funds for comprehensive development planning.

The inquiry involved both public and private sectors of the economy in the use and development of human, natural and institutional resources. The recommendations are the authors' suggestions to strengthen citizen efforts to develop these resources in profitable and satisfying relationships.

REGION

Within the region from New York to Virginia is found the highest human population density in the United States and an intensive concentration of wealth, industry, banking, commerce, educational institutions and cultural activities. In contrast to this image of the city and urban complex, the region is also characterized by being on the edge of the forest. Nearly one-half the land is in forest cover, agriculture is a significant land use, rainfall is an abundant resource, and some states maintain relatively pristine streams. Fish and wildlife resources are both abundant and diversified.

It is in this setting that citizens have recognized the need for resource planning and development. Of the 272 counties in the six states, at least 174 counties (64 percent) had formal planning commissions in 1965. Another measure of the interest in resource planning is the fact that about 75 planning consultant firms with sizable staffs are active in the region.

It is clear that the 42 million people living in the six states and their governments have decided that resource planning and development can make a significant contribution to the development of a satisfying living and investment atmosphere in the nearly 100 million acres involved in the inquiry region. Today, only six percent of the region is considered urban and built-up. Projections to 1975 indicate this may reach eight percent. This means that more than ninety percent of the region will be classed as farm and forest, with declines in all categories of agricultural use and the strong suggestion of substantial increases in the amount of land reverting to brushland and forest cover. This

adjustment of land and people out of agriculture is substantiated by all statistical measures, and is strikingly visible in all states visited in the movement of shrubs and trees down from the hills to reclaim abandoned farms.

Although fewer acres and less people will be engaged in farm production in the region, it is anticipated that farmers and forest landowners in the region will maintain, if not expand, their share of the national food and fiber market. Also, it is expected that there will be an increasing interest in purchasing land for nonfarm rural uses and that rates of urban sprawl will accelerate unless checked by new concepts of guiding development. The public conception which suggests that this area will be "covered with concrete and asphalt" at some future date appears to be unfounded. In fact, the real challenge to research, education, planning and development agencies of the region lies in formulating a strategy and expediting programs dedicated to the reuse of human and natural resources.

AGRICULTURAL AND FOREST RESOURCES

With the national harvest area of 50 years ago and less than half the labor force, agriculture not only feeds nearly twice as many Americans but supplies a growing export market. The shift of people from the farms to the cities and city dwellers invading the countryside have both contributed to the increase of forest area in this highly populated region. As farms are abandoned or become country residences for urban workers, trees frequently take over much of the open land by natural succession. The rural nonfarm population, whether it be subdivisions or individual estate or country homes, place unfavorable pressures on farmland in some cases, but often encourage the invasion of trees and woodland.

Concern about farmland and timber scarcity is being tempered somewhat in light of research and knowledge relating to the impact of science and technology on resource uses.*

Release of significant acreage of land from agricultural uses means that for the first time in the history of the nation higher planning priorities can be placed on land for industry, commerce, transportation, recreation and water supply without jeopardizing relative abundance of low-cost food and fiber for national and international markets. Community land use priorities based on locational values and development benefits to the total community and its natural environment will tend to be higher in the future than priorities based on soil fertility and productivity for agricultural and forest products.

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* A more comprehensive analysis of research reports and projections on agricultural and forest resources production and use is in the appendix.

Effectiveness of planning for urban development in rural areas

The question

How effective in terms of citizen satisfaction are planning programs directed by consultants and/or resident planning staffs in the inquiry area?

Conclusions

1. The most effective planning process in terms of citizen satisfaction is where a county or a group of counties have resident planning staff capabilities and financial resources to develop and implement the comprehensive plan for the area served.

Complexity in the time schedules of consultants and activity patterns of persons in the community or area involved hinder the scheduling of professional counsel and use of needed continuing planning assistance. Decisions are made by hired professional representatives, often socially as well as physically distant from those they are attempting to represent. Rural people are better satisfied with resident planning staff which is available for discussion, conference, and consultation. Without this local planning staff capability, individuals, groups and local government are left without professional compentency to seek solutions to problems and to implement appropriate action.

2. Volunteer local citizen groups without the aid of professional resident planning assistance and adequate financing lose interest and effectiveness fast.

In many counties there exists local government or quasi-government agencies for various functions such as resource development, tourist development, industrial development, and land use and resource planning. Many states offer matching financial inducement for industrial and tourist development to these local agencies. In all cases the success of any type of development will be largely dependent upon the soundness and effectiveness of the planning program. Without planning and appropriate action for resource development, efforts at industrial and tourist development are essentially promotional endeavors with questionable and often frustrating results. Promotion cannot take the place of planning

and appropriate resource development, nor should it precede them. In many instances colorful brochures and promotional literature far exceed the actual performance of development to be found in the area. These promotional efforts are often undertaken without understanding the nature of land use and resource development upon which the promotion of business, industrial or other economic interests depend.

3. The lack of personal and professional career stability of rural county resident planners and consultants is detrimental to the development and implementation of plans in rural areas.

A hazard that threatens continued rural resident support of the formal planning process is the extreme planner employment mobility at the federal, state, county and local level. When a resident or consultant planner leaves a rural situation, the program stagnates. A new or inexperienced planner is hired and must literally start over in plan development and in gaining community acceptance. In this type situation, comprehensive development planning leads to community frustration because implementation and accomplishment are so slow in showing any results.

4. Planning for urban development in rural areas places heavy stress on land use controls such as zoning and subdivision regulations as devices to direct and control movement onto farm and forest lands.

Rural resident reaction has been based largely on value judgments regarding the restrictive features of land use controls even though the controls are seldom effective in guiding development and controlling costs.

Requests for and granting of rezoning without consideration of adequate public facilities, especially water and sewage disposal, on the basis of community pressures contribute to sprawl, inequities in costs, and deterioration of the natural environment.

5. Present plans for rural areas, such as townships, generally ignore the cost and ecological aspects of needed community facilities for urban growth.

It appears that the approach most often used is to build first and

then worry about water, waste disposal, sewers, recreation and transportation facility costs.

During the past decade many have fled from urban centers with the thought of free or low-cost water and sewage-on-site in rural areas. The resulting problems in the region are not yet fully understood by either those remaining in urban areas or those who fled to rural areas.

Heavy emphasis on land use controls such as subdivision regulations and zoning ordinances to control and direct movement into agricultural and forest areas has resulted in much resistance in rural areas and usually resulted in ineffective control and high community development costs.

The "extra" cost for needed public facilities will be a heavy burden for years. Seldom have developers paid for more than extensions to already overburdened public facilities. It is rare indeed when the total cost to the capital facilities of the added extensions is recognized by the community or paid for by the new neighbors.

Effectiveness of planning for urban development in rural areas

The question

How effective in terms of citizen satisfaction are planning programs directed by consultants and/or resident planning staffs in the study area?

Recommendations

1. A program of state planning assistance funds for groups of predominantly rural counties that establish and maintain resident planning staffs would help strengthen long-run citizen support for comprehensive planning in rural areas. The state matching fund would be in addition to the federal "701" planning assistance program. Its use would be prohibited for planning consultant fees.

   In low-density predominantly rural counties, consideration should be given to planning and development commissions or districts which would be responsible for resource use planning, tourist-recreation development and industrial development in those areas where the planning process made such developments a realistic possibility. In the absence of such commissions or districts or where their establishment is not feasible, it is essential that the use of economic force or "purse-string power" be used to require the coordination of these development functions at the local level.

   For this reason, state-local matching funds for resource planning and development would be especially meaningful to aid sparsely populated rural areas, and it would strengthen both industrial development efforts and tourist-travel development in those areas where the planning process made such developments a realistic possibility.

   The availability of adequate financing would join the vitality of citizen leadership with the expertise of a professional resident planning staff and increase the effectiveness of the planning process in rural areas.

2. County or regional resident staffs could strengthen and add depth to their planning programs by supplementing resident staff competency

through specialized consulting contracts.

The use of consultants for specific functions could be applied in such a way as to enlarge rather than contract the role of consultants in the preparation and implementation of plans. Planning consultants are most effective as specialists in programming the environmental and public facility aspects of comprehensive plans--especially water, waste disposal, sewer and transportation facilities.

3. Whether the relationship of the resident rural county planner should be in an advisory capacity or be in a staff position to county government needs further exploration and consideration in attempts to strengthen the continuing rural planning programs and implementation as an essential function of government.

Stress on the relationship of the planning staff to other government departments seems to become more critical during the plan implementation process. Answers to questions involving whether the advisory nature of the planning responsibility was conducive to plan implementation was beyond the scope of this study.

Morton Lustig, President of the Pennsylvania Planning Association, recently stated that if we agree that planning is now serious governmental business, and if we agree that plans are actually intended to control or direct community development, then comprehensive plans must be approved by the governing body on referral by the planning commission.1/

4. Much additional study is needed on the use of capital facilities budgeting as a major plan effectuation instrument along with land use controls to guide resource development in rural areas.

A combination of land use controls and an enlightened and aggressive public facility and capital budgeting policy would tend to result in lower development costs for the developed and developing segments of the area.

People are less anxious to move into areas of relatively high-cost services. Perhaps the most effective method of guiding or directing

1/ Lustig, Morton, 1966 Adopting the comprehensive plan. Pennsylvania Planning Association News, Vol. II, No. 2, March-April, 4 pp.

development in rural areas is for urban centers to resist aggressively community facility expansions until satisfactory and effective financing is assured. When it costs the individual more to provide water and sewers to him than it is worth to him, then perhaps communities should resist doing it for him. The necessary first step in controlling urban sprawl is to alert people of the extra costs (financial and in terms of environmental deterioration) to both urban and rural areas. Knowledge of the total development costs would tend to dampen the clamor for extensions to already overburdened central city water and sewer systems.

Economically and ecologically sound, orderly growth would tend to minimize development costs in urban areas and reduce the tendency to flee urban problems by moving to farm and forest areas.

Natural resource relationships of comprehensive development planning

The question

Is a comprehensive development plan for an area dependent upon natural resource analysis and interpretation in order to insure implementation and development?

Conclusions

1. The lack of natural resource elements limits the "comprehensiveness" and effectiveness of planning programs.

Plans of development for the inquiry region showed a lack of soil survey information, a failure to recognize mineral values, an absence of comprehensive water data, and a deficiency of meaningful forest and wildlife resource data and interpretation.

Present plans feature spatial design and have a strong social and economic base orientation. More complete use of natural resource data and relationships would make the plans and their implementation more ecologically oriented. Resource use decisions, controls, and development based on ecological as well as social and economic considerations would come much closer to total environmental planning and development than those which overlook or omit natural resource relationships. Ecological considerations would stress the natural environment aspects of a region.

2. Concern for man's relation to his natural environment requires land use policies which recognize ecological relationships of soil, water, forest, and wildlife resources and their values to society.

McHarg[2/] suggests that the values of land, water, and air resources justify a land use policy which reflects both the value and the operation of natural processes in the environment. In view of the observed absence of data concerning natural resources noted during the inquiry, planning programs should consider surface water and water aquifers, riparian lands, flood plains, marshes, soils, forest lands, wildlife resources, air corridors, scenic beauty and recreational potential.

2/ McHarg, I. L., 1964. Metropolitan open space from natural processes. Mimeo paper. University of Pennsylvania, Philadelphia. 80 pp.

McHarg, further points to the paradox and tragedy of metropolitan growth and suburbanization that often destroys its own objective. He stresses that a major necessity of planning today is the elaboration of simple rules which can realize the laudable objective reflected in the flight to the suburbs without concomitant destruction of the natural environment and disillusionment of the people involved.

3. <u>There was a lack of involvement and participation of public and private natural resource professional staffs in local planning programs</u>.

During the course of the inquiry in the region there was a general lack of involvement of natural resource professional staffs, such as state and federal conservation agencies, in planning programs. Private conservation organizations such as sportsmen's clubs, forest industry, water recreation and boating interests, and other natural resource citizen groups have not participated effectively in formal planning efforts. Some public agency coordination at the state level was noted, but at the local planning level the absence of contact was particularly glaring. Even though many state and federal agencies have major ownership and management responsibilities for land and its attendant resources, they somehow fail to participate as fully as would be desirable to strengthen local planning programs. Private conservation groups have been effective in their individual natural resource projects but they have not coordinated their interests in natural resource relationships into comprehensive land use planning programs. Several reasons may account for this: They are not fully aware of local planning functions and local government powers and responsibilities in land use planning and guidance; they fail to recognize their interests in the land use and resource planning process; or they do not recognize the contributions their knowledge and their professional competency could make to the local planning programs. Also, resident county planners and planning consultants may neglect to involve them in the program.

4. <u>Water resources planning and development in the region have been seriously neglected in local planning programs, and river basin planning and development were not well coordinated with local planning</u>.

The six states of the region, and others of the Northeast, have all been especially remiss with regard to water resources. Loss of water quality has been a continuing problem which shows only sporadic instances of improving in certain locales. The overall situation is one of continued decline in water quality. Low seasonal rainfall the

past several years in the Northeast and elsewhere has focused much attention on the problem.

Major river basin studies and plans, especially the current Susquehanna River Basin Study and the interstate-federal Delaware River Basin Commission, all have coordination of a multiplicity of federal and state agencies. At the federal level, the U.S. Department of Housing and Urban Development which administers the federal participation in state and local planning assistance is part of these river basin planning and development programs. However, at the county level we noted little cooperation, coordination, or understanding of the relationship of river basin resource planning and development with local planning and development.

The Fish and Wildlife Coordination Act at the federal level, the trend in review privileges of local planning assistance programs, and the mandatory state recreational plan in order to participate in the recently passed Land and Water Conservation Act are all attempts to strengthen land use and resource planning and development, especially in rural areas.

In Pennsylvania the Sewage Facilities Act of 1965 represents significant action aimed at halting the destruction and pollution of the natural environment. This legislation requires the state's municipalities to plan for sewage facilities where population expansion is anticipated. Plans must be submitted (effective July 1, 1967) to the Department of Health and must indicate:

--Location of present public sewage systems.
--Anticipated extension of sewage facilities for next decade.
--Where on-lot (septic tank) sewage disposal is feasible.

5. <u>Use of soil surveys and appropriate interpretation is being recognized as an essential basic element in comprehensive development planning</u>.

Some notable exceptions to the absence of resource science in the planning process were noted during the study. Accelerated soil survey work is now an eligible item under "701" planning assistance studies, and many counties in the inquiry region are undertaking this work in cooperation with the Soil Conservation Service and land-grant universities.

In Virginia, an arrangement has been developed with Virginia Polytechnic Institute for soil analysis and interpretation by soil scientists assigned to several counties, as well as a concerted effort by V.P.I. to strengthen the contribution of soil surveys to the state planning effort. The predominant resource agency contribution mentioned most frequently by resident county planners in all states in the region was that of the Soil Conservation Service staff.

6. The nature, magnitude, and implications of farm and forest land use adjustments are not well understood.

As the result of commodity emphasis, too little attention has been given by research and education to analysis and interpretation of long-term trends in land released from agriculture. Reversion of much of this land to brush and forest cover has been by default. The increase in forest acreage in Pennsylvania represents a 6 to 7 percent increase in the past decade.3/ Research and education have clearly failed to anticipate and accommodate the fundamental shifts in society's aspirations and goals with respect to the natural environment of land and its attendant resources.

In New York state, projections and land-use trends developed by land economists and natural resource scientists have had a significant impact on helping to shape change and adjustments. Resident county planners in New York more fully recognize the issue of reuse of land resources as the result of this research and educational contribution.4/

7. Useful natural resource statistics and interpretations are seldom readily available for local comprehensive development planning.

Reliable forest resource statistics are seldom available on a county basis. The sampling methods, data, and analysis of timber species, growth, and volume generally apply to a broader regional basis. This shortcoming of forest statistics often limits their utility and accuracy in county planning programs as well as for educational and action programs of organizations, both public and private.

Recently the Area Redevelopment Administration authorized and published a report by Horn and Graham5/ on forest resources for the wood-based industry in Pennsylvania. A significant part of this study was an intensified survey of the forest resources on a county basis. Release

3/ U.S. Forest Service 1965. Preliminary forest survey statistics by counties. Pennsylvania. Northeastern Forest Experiment Station, Upper Darby, Pennsylvania. Multilith report.

4/ New York State College of Agriculture, 1965. Promise of New York's rural resources. College of Agriculture, Cornell University, Ithaca, New York, 38 pp.

5/ Horn, A. F. and P. H. Graham. 1965. Opportunities for forest-based industries in Pennsylvania. Area Redevelopment Administration, U.S. Department of Commerce, Washington, D.C. 248 pp.

of preliminary county statistics by the Forest Service[6/] clearly confirms a substantial increase in forest acreage in the state. Over 17 million acres (59 percent) of Pennsylvania is now forest versus 11.7 million acres in all other uses.

Aside from recreational hunting and fishing, some commercial fish and shellfish industries are dependent upon the fishery resources of an area. Nearly all rural land uses and developments occurring in rural areas have an effect on fish and wildlife habitat, populations, movements, and opportunities for use of these resources. Other types of recreation notwithstanding, fish and wildlife resources are the focus for the vast majority of outdoor recreation interests.

A specific example of where wildlife resource data and analysis should be used in planning and development is the serious highway-deer collision conflict. The magnitude of the problem is highly significant for the urbanized Northeast since over half the nearly 100,000 annual highway-deer kills in the nation[7/] occur in this heavily forested, heavily urbanized region which is laced with an extensive highway network. This public safety issue deserves the fullest support of highway engineers, land managers, wildlife resource administrators and biologists, conservationists, the motoring public and local planners.

8. Local conservation commissions are effective in strengthening local comprehensive development planning.

In New York and Pennsylvania within the inquiry region and to a much greater extent in Massachusetts, Connecticut and Rhode Island, the formation of local conservation commissions offers the opportunity for reflecting a great deal more natural resource content in land use planning. In the New England states these commissions are the official agency charged by the town (township) with the development and conservation of natural resources. Barske[8/] cites some constructive results of this relatively new local government function in New England. Work with the local planning commission in preparation, review and implementation stages of land use planning are essential ingredients of the effort. Advice, counsel, and technical assistance is provided to local conservation commissions by a variety of state agency representatives. This insures natural resource content being strengthened in local planning programs.

6/ U.S. Forest Service 1965. Preliminary forest survey statistics by counties. Pennsylvania. Northeastern Forest Experiment Station, Upper Darby, Pennsylvania. Multilith report.

7/ Thompson, F. A. 1965. Deer and highways. New Mexico Department of Game and Fish, Santa Fe. Multilith report. 14 pp.

8/ Barske, P. 1963. Grass roots conservation. Conservationist. 17:4:31-33. New York Conservation Department, Albany.

In Montgomery county, Pennsylvania, the Montgomeryville Township Conservation Commission was effective enough to have stimulated action for one of the first local government allocations of state-local matching funds for acquisition of a natural area. This was coordinated with the county planning commission.

9. Natural scientists and natural resource professionals can and should contribute to local planning programs.

The U.S. Fish and Wildlife Service has worked effectively with the states in the Northeast and other parts of the nation by contributing wildlife resource and wildlife habitat knowledge into local planning assistance programs. The Branch of River Basin Studies has played a major role in contributing scientific data and sport and commercial values to fish and wildlife resources, especially in the coastal marshes, wetlands, estuaries, rivers and bays of the study region.9/ These brief but meaningful reports indicate the characteristics and extent of various fish and wildlife habitat types, a summary of the fish and wildlife populations and their uses and values, both recreationally and commercially, analysis of the effects of development on these resources, and suggestions on ways and procedures to obtain full community benefits of these resources within the planning process.

When natural scientists and natural resource professional staffs are willing to contribute their knowledge and professional competencies to land use and resource planning programs, they can provide much needed assistance to others less qualified in the various natural resource disciplines such as soils, forestry, hydrology, minerals, wildlife, and ecology.

Significant recommendations in the President's Science Advisory Committee Report on Restoring the Quality of Our Environment10/ stress the necessity for land use decisions to consider all forms of environmental pollution. Obviously this will require much more ecological thought in comprehensive development planning and much more commitment from and involvement of natural resource scientists in the planning process.

9/ Gottschalk, J. S. and J. T. Gharrett. 1963. Report on fish and wildlife resources to John J. Holland, Planning Director, Cumberland county, New Jersey. U.S. Fish and Wildlife Service, Boston, Massachusetts. 5 pp.

10/ President's Science Advisory Committee. 1965. Restoring the quality of our environment. Report of Environmental Pollution Panel. Government Printing Office. 317 pp.

Natural resource relationships of comprehensive development planning

The question

Is a comprehensive development plan for an area dependent upon natural resource analysis and interpretation in order to insure implementation and development?

Recommendations

1. Planning for urban development in rural areas and accommodating urban pressures on natural resources must consider the total natural environment.

Concern for the natural resource relationships (ecological considerations) in land use and resource planning programs was expressed by us in an earlier publication.11/ Since planning programs are not restricted to the urban centers, but encompass entire counties and more recently entire regions, it is proper that the planning programs give consideration to the total natural environment and all the natural and biological processes that are part of the environment.

Comprehensive development plans should include natural resource elements on soil, water, forest, wildlife, and mineral resources. The general characteristics of the county or region should dictate the extent and usefulness of data concerning the latter two elements rather than establish rigid limits. However, the soil and water elements should deal in depth with these resources.

There is a great need for more complete use of natural resource data and their relationship to people's aspirations which would strengthen the plans, the planning process and plan implementation. Much more of the ecological approach to natural resource planning and development would broaden the support and effectiveness of planning and development in rural areas.

We strongly encourage the concept of the application of science to land use and natural resource planning, development, and use.

11/ Carroll, W. M., R. G. Wingard and C. J. Wingfield. 1963. Rural land use planning. College of Agriculture, Cooperative Extension Service, The Pennsylvania State University, University Park. 24 pp.

2. If ecological considerations and the integrity of the natural environment are accepted as planning objectives, then coordination of federal, state, and local planning programs should be mandatory.

Because of the multiplicity of public agencies having responsibilities in natural resource management, development and use, it is recommended that at the state level interdepartmental coordination be mandatory between the state planning agency, and the state natural resource agencies to strengthen planning for urban development in nonurban areas.

Where river basin planning and development or single function development agencies operate at the federal or interstate level the same mandatory coordination with the states should be required. It should be the responsibility of the state "701" administrative agency to alert and inform local planners and consultants of impending programs at state, interstate or federal levels as planning work programs are reviewed at appropriate periods.

Project requirements for "701" urban planning assistance are recommended to include coordination at the local level with local professional staffs of appropriate natural resource agencies such as: conservation departments, forest departments, water departments, fish and game departments, agriculture departments, health departments and others. This recommendation would broaden the base of public support and strengthen the professional competencies of planning programs and resource development by local government.

Local planning and development patterns can do much to further focus on solutions of adequate safe water supplies and abatement of further pollution of surface and underground waters. However, since political boundaries of planning units seldom coincide with natural watershed units it is essential that broader watershed planning and development be coordinated with local planning efforts.

3. Consideration should be given to the use of economic or "purse-string power" methods to make comprehensive development planning truly comprehensive by including more complete natural resource analysis and interpretation.

There is a strong need to strengthen the state and federal planning assistance studies by requiring more detailed hydrology and specialized water studies, mineral, forest and wildlife resource analysis and natural environment interpretative studies as part of the planning process.

National attention and high levels of citizen interest are now

focused on the natural environment.12/, 13/ These reports clearly point to the need for private and public understanding and action directed toward all forms of pollution and destruction of natural resource relationships. For planning programs to fail to respond to these natural resource concerns would be inexcusable. To fail to use financial stimulation for strengthening natural resource elements would be omitting a powerful force for increasing the comprehensiveness of planning programs.

Specialized water resource studies should be included as part of the comprehensive plan where coordination with existing river basin or watershed planning and development does not satisfy local situations. Likely these will have to be done by consultants or state or federal agencies because of the nature of the problem which could seldom be undertaken by local staff. Water supply and sewage studies are approved elements of "701" planning assistance in Pennsylvania because of the Sewage Facilities Act of 1965. Engineering approaches alone to water and sewage have proven inadequate in the past. For this reason it is strongly recommended that biological and ecological considerations be incorporated into all aspects of water resources planning.

As useful as the Forest Service Timber Trends Reports may be on state or regional areas, the need for county data is essential to include the forest resources into county planning programs. This would make it possible to relate the industrial forest uses with other goods and services of forest lands for county planning programs. Intensification of forest resource studies to include area, ownership, forest type, species, growth, volume, cut and relationships to industrial uses and other forest uses on a county basis should be included as part of comprehensive planning and development for rural areas. These additional studies, where not already available on a current county basis, should be considered as an element of comprehensive plans in those counties having at least 20 percent of the land area in forest cover.

Both fish and wildlife resource data for local planning should include the nature and characteristics of the major habitats in the area, fish and wildlife populations associated with these habitats, effects of various types of developments in these habitats on the fish and wildlife populations, the value and use of the resources including access to land and water habitats. Suggestions of the pattern of developments permitted, excluded, and standards for facilities in the area should reflect the full range of relationships of these resources to obtain community benefits.

Much of this natural resource information could be provided by natural resource agency field staffs. However, some additional staffing, financing, or adjustment in program may be required. And in some instances, specific new studies would be required.

12/ Secretary of Interior, et. al. 1965. A report on natural beauty to the President. Government Printing Office. 16 pp.

13/ President's Science Advisory Committee, 1965. Restoring the quality of our environment. Report of the Environmental Pollution Panel. Government Printing Office. 317 pp.

Many fish and wildlife resource agencies are supported solely by user fees through hunting and fishing licenses, yet the fish and wildlife resources yield broad community benefits. Consideration should be given to strengthening this planning phase from public finances through federal-local matching grants.

The California Fish and Wildlife Plan[14/], developed with an urban planning grant of Section "701" of the 1954 Housing Act, as amended, is a commendable precedent in the use of general public funds to strengthen natural environment and fish and wildlife resource planning and management. While the several volumes of this state plan will be of substantial value to local planning programs, continued local professional staff coordination is considered essential to support the continuing nature of a successful and effective planning process.

14/ Department of Fish and Game. 1965. California fish and wildlife plan. Vol. I, Summary. Sacramento. 110 pp.

Land-grant university natural resource planning and development curriculums and research programs

The question

Are land-grant universities conducting research and making curriculum revisions and curriculum development that give recognition to the environmental factors in earth sciences, life sciences, social sciences, and regional studies?

Conclusions

1. Land-grant universitites in the region are attempting to strengthen their research and educational efforts in resource planning and development, although none have fully met the need.

The six land-grant universities visited are responding to society's concern for the natural environment by developing institutional arrangements, such as institutes, bureaus, or centers which will afford the opportunity for interdisciplinary research and education in resource planning and development.

Some of this change has been stimulated by federal and state financial grants. For example, the Water Resources Research Act of 1964 literally forced many land-grant universities into water resources research and educational programs which were largely ignored prior to the Act.

Some state and federal grants for community facilities and community development projects require a comprehensive development plan as part of the eligibility for these funds. This mandatory requirement has tended to stimulate professional career opportunities in resource planning and to speed curriculum revision which recognizes the environmental aspects of earth and life sciences as part of broad regional studies.

Programs of scientific organizations, such as the American Association for the Advancement of Science, professional societies, and national conferences, such as the North American Wildlife and Natural Resources Conference, are giving increasing attention to natural resource and land use planning as part of their concern for complex environmental problems.

2. Resident planners and consultants generally recognized the need for

better understanding of rural resident values and the need for more effective communication with residents of rural areas.

Many comments by planners indicated that county agricultural extension agents have a strategic educational leadership position in the planning process. However, there was some feeling expressed that extension staffs did not recognize the scope and nature of farm and forest land use adjustments. As a result, extension educational emphasis reflected an agricultural protectionist viewpoint which tended to discourage participation of farmers and other rural residents in the planning process. This appeared to drive a wedge between rural and urban people which was not in the best interests of either.

Land-grant university natural resource planning and development curriculums and research programs

The question

Are land-grant universities conducting research and making curriculum revisions and curriculum development that give recognition to the environmental factors in earth sciences, life sciences, social sciences and regional studies?

Recommendations

1. Land-grant universities could and should move more aggressively to respond to the research and educational challenge implied in society's concern for natural environment planning.

Land-grant universities, especially Colleges of Agriculture, with strong orientation and staffing in land, soils, water, forests, wildlife, and ecology could greatly strengthen their research and educational contribution to the planning process by training more graduates for natural environment planning and development. This would significantly increase the understanding of and support for resource planning in rural areas.

Professional education in planning is chiefly centered in architecture, landscape, or engineering departments which accounts for the current heavy emphasis on spatial design planning and largely ignores complex ecological relationships. This also accounts, at least in part, for rural resident resistance to comprehensive development planning. Much planning has been ineffective in dealing with natural environment problems beyond the professional competency of many planning staffs.

Many of the apparent gaps in plans, planning staffs, and most significantly in plan implementation and effective accomplishment could be plugged by university action. Professional educational opportunities should be broadened to encourage entrance of a broader variety of disciplines into planning curriculums.

Universities can be most effective in the planning process by providing much of the basic science. Scientific research coupled with adequate financing, vitality of citizen leadership, and the expertise of broadly trained professional resident planning staffs will create the thinking atmosphere needed to develop plans that will bring the natural environment--soil, water, air, plants, and animals--into productive and pleasing combinations for the use of people.

State administration and supervision of the "701" local planning assistance matching funds

The question

How are "701" local planning assistance matching funds being administered at the state level?

Conclusions

1. There are wide differences in the administration and supervision at the state level of the "701" local planning assistance matching funds.

Although the planning effort in all the states in the region featured spatial design rather than fundamental environmental relationships, the amount of time and money spent on supervision per planning project or on total planning dollars expended appeared to vary greatly.

2. The time lapse between climax of planning organizational activity, availability of funds, and availability of professional staff planning assistance was noted as being particularly disruptive to effective planning in rural areas.

Orderly flow of funds from all sources early in the project period appeared to be an essential element in building local confidence and support for the planning process. Doubt due to delay in the arrival of matching funds early in the project period was especially disruptive to the professional staff and to local citizens and local public agency personnel involved.

3. Rigid contract periods were unduly restrictive in rural areas.

This was especially evident when consultants were required to travel great distances to reach the community involved.

4. There was strong interest in making more time and additional funds available to planning consultants to conduct educational programs prior to and after the actual specific plan preparation process.

5. The conviction was strong that universities should not contract directly with communities to prepare comprehensive plans.

Much of the conviction was based on the feeling that since universities can not assume responsibility for planning actions, they should not be directly involved in the action phases of the plan development or plan implementation.

State administration and supervision of the "701" local planning assistance matching funds

The question

How are "701" local planning assistance matching funds being administered at the state level?

Recommendations

1. Additional study of the effectiveness of various combinations of state administration and supervision is required to adequately measure the significance of the unique combination of human, natural and institutional resources represented in the region and the planning administration and supervision cost in monetary terms and in terms of citizen satisfaction.

2. State administrative and supervisory staffs should be of sufficient size and quality to expedite the processing of project applications and the flow of project funds to approved projects.

3. The length of the project contract periods should be related to the availability of qualified professional planning assistance and the relative isolation of the community involved.

4. When planning consultants request it and procedures are outlined, funds and time should be made available to conduct educational meetings to inform local citizens about the specific contribution the consultants have contracted to make to the comprehensive plan.

5. **Universities should not contract directly with communities to prepare comprehensive plans.**

Universities should limit their efforts to resource management research, resident instruction and extension educational programs.

IMPLICATIONS

The region of inquiry has many rural areas where the natural environment has been destroyed. Waste disposal is the principal challenge facing the region. Mineral extraction, residential, industrial, agricultural and recreation wastes continue to pollute the natural environment.

Rural residents appear to support the comprehensive planning process, but present plans do not reflect their concern for the natural environment. The planning process itself would benefit from a reexamination as to whether it is so organized in rural areas as to make possible the fixing of priorities and the affirming of values beyond those of the present.

A principal limiting factor in the effectiveness of planning for urban development in rural areas is the lack of natural resource elements in comprehensive plans. Promising land-grant university programs in curriculum revision and development and research which show an increasing recognition of the environmental factors in earth sciences, life sciences, and regional studies are evident in the inquiry region. But present planning programs continue to be plagued by shortages of scientific data and qualified personnel.

Effective environmental planning when viewed as guiding the elements of growth and development of the total environment toward socially accepted goals is dependent on citizen understanding and support.

Limited observation and inquiry indicates the following implications for residents of both rural and urban areas who are concerned about total environmental planning.

(a) Present planning programs feature spatial design and have a strong social and economic base orientation but lack guidance on essential natural resource relationships.

(b) The release of significant acreage of land from the production of food and fiber provides a continuing challenge to research, education, planning and development agencies of the region to formulate strategy and expedite programs dedicated to the reuse of human, natural and institutional resources without destroying the natural environment.

(c) It is essential that adequate financing arrangements be developed that include the use of economic or "purse-string power" to require coordination of total environmental planning at the federal, state, river basin and community level.

(d) University curriculum revision and development to permit a greater understanding of the man-environment relationship by scientists, students and citizens would greatly strengthen the contribution of environmental planning to our level of living.

(e) Rural legislative structure and organization should be constantly reexamined as to whether they are so organized as to make possible the fixing of priorities and the affirming of environmental values beyond those of the present.

Limited time and finances permitted only casual observation of citizen satisfaction and support of planning for urban development in rural areas. It is suggested that additional inquiry and study of the planning process relationships of environmental sciences coupled with adequate financing, professional resident staffs using specialized

consultant services and the vitality of enlightened citizen leadership, would provide benefits in terms of greater satisfaction to all segments of our culture.

APPENDICES

Urban Planning Assistance Program

The Urban Planning Assistance Program is one of the programs administered by the Urban Renewal Administration (URA), a constituent of the United States Department of Housing and Urban Development (HUD). It is popularly called the "701 Program" because authorization by section "701" of the Housing Act of 1954, as amended, Section "701" makes possible federal grants to supplement state and local funds for the purpose of financing comprehensive urban planning activities. These activities include the following, to the extent they are directly related to urban needs:

1. Preparation of a comprehensive development plan for the pattern and intensity of land use and the provision of public facilities, including transportation facilities, together with long-range fiscal plans for such development.

2. Programming and scheduling of capital improvements, together with definitive financing plans for the improvements to be constructed in the earlier years of the program.

3. Coordination of all related plans of the departments as subdivisions of the government concerned.

4. Intergovernmental coordination of all related planning activities among the state and local governmental agencies concerned.

5. Preparation of regulatory and administrative measures in support of the foregoing activities.

Within this framework, eligible applicants are encouraged to provide for a work program which can meet the unique needs of each individual community. Applicants are also encouraged to employ and develop new and improved planning techniques to deal with problems which they encounter.

Comprehensive Planning

Inquiry conclusions and recommendations are based on the following concept of comprehensive planning:

Comprehensive area-wide planning is a systematic and continuing process designed to help solve current problems and provide for future needs. It includes the identification and continuous refinement of objectives and criteria; collection and analysis of pertinent data; consideration of alternative courses of action; policy decisions on selected courses of action; coordination of local plans and of programs and activities affecting the development of the area; and formulation, maintenance and updating of a comprehensive development plan and of measures to implement and plan. Comprehensive planning covers land use, transportation, water and sewers, open space and recreation, housing, health and education facilities, community development and renewal, and other aspects of physical, economic, social and resource development of significance to the particular area.

Environment Principles

Inquiry implications are influenced by the following principles from "Restoring the Quality of Our Environment."[15/]

1. The public should come to recognize individual rights to quality of living, as expressed by the absence of pollution, as it has come to recognize rights to education, to economic advance, and to public recreation.

2. The responsibility of each pollutor for all forms of damage caused by his pollution should be effectively recognized and generally accepted. There should be no "right" to pollute.

3. The roles of all governmental authorities, local, state, and federal, in pollution problems should be complementary and mutually supporting.

4. Federal agencies should give special attention, in all operations they conduct, support, or control, to avoiding and managing pollution, both to reduce it and as an example to others.

5. All agencies and organizations concerned with pollution should strengthen programs that lead to better public understanding of pollution and its problems.

6. All concerned should recognize the quality of human life and the presence and growth of other living things as the major values currently damaged by pollution.

15/ President's Science Advisory Committee. 1965 Restoring the quality of our environment. Report of the Environmental Pollution Panel. Government Printing Office. 317 pp.

7. The special importance of the automobile as a source of pollution problems should be clearly recognized.

8. As our pollution problems became steadily more serious, it should be generally recognized that we must consider our balances and choices within successively larger and more complex systems.

9. Each department or agency having responsibility for both enforcement and research in pollution should provide administrative and budgetary separation sufficient to minimize interference between its research and development activities on the one hand, and its investigative and enforcement activities on the other.

10. In making decisions about resource use and community development, including transportation systems, urban renewal, irrigation, drainage, and agricultural practices, information about effects and behavior of pollutants should be an essential consideration.

11. The filling-in of shallow waters essential in life cycles of fishes and shellfish be regarded as an important kind of pollution.

12. The control of pest populations should increasingly depend on an integrated combination of pesticide use with a wide variety of bioenvironmental techniques.

13. Unnecessary use of pesticides should be avoided whenever possible.

Agricultural Resources

Productivity of agriculture is a principal source of strength to a growing and progressive national economy. The country's land resources are being used so effectively that with the harvest area of 50 years ago and less than half the labor force, agriculture not only feeds nearly twice as many Americans but supplies a growing export market.

Agriculture has made and will continue to make indispensable contributions to national economic growth. These contributions include abundant supplies of low-cost food; counteraction of inflationary movements in the general price level; large purchases of industrial goods; release of workers to the industrial and professional labor force; large export earnings; and release of land for growing urban and recreational needs.

Release of significant acreages of land from agricultural uses means that for the first time in the history of the nation higher priorities can be placed on land for industry, commerce, transportation, recreation, and water supply without jeopardizing relative abundance of low-cost food. Land use priorities based on locational values and development costs to the total community will tend to be higher in the future than priorities based on soil fertility and productivity for agricultural and forest products.

Dr. Earl O. Heady, professor of economics and executive director of the Iowa Center for Agricultural and Economic Developments estimates that surplus acreages, in the absence of some unexpected or enlarged foreign demand, will increase. The term "surplus acreage" refers to

land not needed for field crop production and which could be shifted to grazing, forestry, recreation, or other urban uses. Under the potential technology for 1975, the surplus acreage to be shifted from wheat, cotton, feed grains and soybeans would increase from 56 to 73 million acres.16/

A recent report of the National Agricultural Advisory Commission indicates that as yield-increasing technology has increased and as producers have farmed their land with more managerial and technical skill, it has become clear that not all the land in crops in the early 1950's is needed in the 1960's.17/ This seems likely also to be the case in the 1970's and 1980's, though the more distant the date the less clear the prospects. Large acreages--perhaps 70 million acres under current conditions must be retired--to prevent overproduction of the remaining land in farm production.

Walter Wilcox in the report "Farm Programs and Dynamic Forces in Agriculture"18/ prepared by the Legislative Reference Service of the Library of Congress finds that potential farm production in the absence of acreage diversion programs is increasing three times as fast as 30 years ago with most of the increase occurring in crop production per

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16/ Heady, Earl O., 1965. Potential shifts in commercial agriculture relative to technological change; Policies for long-run solution to surplus problems--Our stake in commercial agriculture, Rural poverty and world trade. 155 pp.

17/ Farm policy in the years ahead, A report of the National Agricultural Advisory Commission, published by United States Department of Agriculture, 1964. 43 pp.

18/ Farm programs and dynamic forces in agriculture prepared by Legislative Reference Service of the Library of Congress and transmitted to the Committee on Agriculture and Forestry, United States Senate, 89th Congress 1st Session. 1964. 21 pp.

acre. Traction power on farms has increased 40 percent in the past ten years and farmers have over five times as much drawbar power as in the 1920's when horses were common. Expenditures for farm pesticides have increased two to threefold in the past ten years. Fertilizer use almost doubled in the past ten years, and use of nitrogen more than doubled.

He finds conditions favorable for further increases in acre yields. Improvements in fertilizer distribution equipment and reductions in cost of fertilizer applied on the land, together with favorable yield response when used with improved technical practices, make large increases in its use highly profitable and probable. Corn Belt farmers may increase their corn yields almost one-third in the next five to ten years by increased fertilizer use in combination with other improved practices.

He finds over 90 percent of all farm products marketed are produced by about 1.5 million farms with sales or $5,000 or more. The number of these farms has changed little in recent years and little change is expected in the near future. However, they are fewer than half of all farms. Relatively large farms with sales of $40,000 or more have increased in number and size in recent years. About 140,000 of these larger farms now account for 37 percent of farm marketings.

In light of these facts Dr. Wilcox suggests a number of implications for future farm policy.

He finds American consumers' food costs low, American agriculture's efficiency unexcelled, and farmers' freedom increased by recent changes in price-support programs.

Although the 1.5 million farm families which market most of the farm products are a minority of the families in the rural areas, they and the industries which service them provide a large part of the rural employment and financial support for local government and welfare services.

The evidence presented indicates the possibilities and economic incentives for increased use of fertilizers and other improved practices are so great that if a sharp decline in farm income is to be avoided, cropland diversion programs, similar to those now in effect, will be needed for the indefinite future.

Science related industry sources indicate that the Western nations by the turn of the century will be able to produce twice as much food as they consume and--if political conditions permit--advanced food production and conservation techniques could be extended to the overpopulated and undernourished areas.19/ New approaches--the protein enrichment of foods, genetic alternation of plant and animals, accelerated germination and growth by electronic means--will be widely used.

These same sources feel that man's essential nutrients are reducible to chemical formula, and ultimately the laboratory will create highly nutritive synthetic foods, equaling in palatability and price the products of the land. As that happens, man's total dependence upon the products of the soil will terminate.

Recent Cornell University estimates show that about 200,000 acres of land are removed from farming per year at the present time in New

19/ David Sarnoff--By the end of the twentieth century, Fortune, May, 1964, pages 116-117.

York state.[20] About 15,000 acres of this area are going into urban uses and probably at least 15,000 acres are being idled because they are interspersed with lands that are being newly occupied by urban uses. The remaining 170,000 acres are becoming rural retired farm lands. (Urban expansion is moving partly onto lands that left farming in past years.) It is estimated that about one-half of all land newly occupied by urban uses each year is land that was previously idled or retired farm land. About 50 percent of all land passing out of farming is cropland. (Usually, however, only about half of the cropland is still in use just prior to final retirement.)

Estimates of the Pennsylvania Crop Reporting Service indicate that harvested acreage of crops in Pennsylvania dropped from about 6 million acres in 1940 to 4.6 million acres in 1964. A decline of about 1.4 million acres in cropland in 24 years.[21]

During the same period estimated cash receipts from Pennsylvania farm marketings increased from about $275 million to $814 million--an increase of more than $500 million.

It is clear that this nation can produce the food and fiber needed for abundance at home, for ample reserves and for exports on fewer crop acres than we have available for use.

World markets for American farm products are becoming increasingly important. The value of U. S. agricultural exports amounted to $6.1

20/ Mimeograph supplement to a Rural Development Program for New York state, titled Facts relative to changes in land use in New York state and to a possible land use conversion program, October, 1964.

21/ Pennsylvania crops and livestock annual summary, 1964, C.R.S. 30, Pennsylvania Department of Agriculture, Harrisburg, Pennsylvania, 104 pp.

billion in 1964, compared with about $3 billion a decade ago and less than $1 billion during the 1930's.[22/] They may rise another $3-4 billion by 1980 to more than $9 billion. In 1963, farm products from 80 million harvested acres--about one acre in four--were exported. These growing exports have become increasingly important in balancing our international accounts with other nations, maintaining domestic farm incomes and stimulating economic development abroad. It does not appear that farm and forest product exports will expand to the extent that they will add additional pressure on crop or forest lands.

22/ Foreign economic growth and market potentials for U.S. agricultural products, Foreign Agricultural Economic Report No. 24, U.S. Department of Agriculture, Washington, D.C., 80 pp.

Forest Resources

Forest resources of the nation have played an important role in the economic and social development of the country. The stumpage value of 10 billion cubic feet of timber cut in 1958 was about $1 billion, while the sum of the value added to all kinds of timber-based economic activity amounted to about $25 billion.[23/]

Concern about the scarcity of timber resources resulted from early exploitation and land clearing for agriculture, U.S. forest and woodland acreage reached a low of 600 million acres in 1900.[24/] Since 1920 the acreage of forest land has been steadily increasing, so that by 1963 the nation's forest area was 759 million acres. Over the past few decades the abandonment of farm land and reversion to timber has more than offset any encroachment on forest lands by other uses. During the decade prior to 1953, additions to the forest acreage exceeded withdrawals by 24 million acres. In the decade, 1953 to 1963, the United States forest acreage continued to increase, although at a slower rate with over 7.5 million acres added to the commercial forest lands.

Now, after more than three centuries of settlement, development and adjustment in land use in the United States, forests occupy 759 million acres or one-third of the 2.3 billion acres of the 50 states.

23/ Hair, D., The economic importance of timber in the United States. 1963. Misc. Pub. 941, U.S.D.A. Forest Service, Washington, D.C., 91 pp.

24/ Wooten, H. H., K. Gertel, and W. C. Pendleton, Major uses of land and water in the United States. 1962. Summary for 1959. Agricultural Economics Report No. 13, U.S.D.A., Washington, D.C., 53 pp.

Two-thirds, or 509 million acres, of this forest land is classed as "commercial" forest land which is defined as suitable and available for the growing of continuous crops of saw logs or other industrial timber products.

In view of the sweeping changes in the agricultural land adjustments that are taking place, it is reasonable to expect some increases in forest land acreage. Often in the past, reverting lands were on the poorest sites which were not favorable to desirable tree species or to fast tree growth. Now that agricultural land is relatively abundant, rather than scarce, landowners and public agencies have the opportunity to bring higher class lands into forest use and timber production where that choice is an economically desirable alternative.

In the inquiry region (about 100 million acres in the six states) forests occupy one-half the land area. United States Department of Agriculture projections of land use changes[25/,26/] show a net loss of 10 million acres of forest land by 1975 for the nation but for the northeast a net gain of three percent or about one and one-half million acres of new forest acreage by 1975. The major loss of forest acreage is predicted for the Southern Plains with a decrease of 17 percent forest land. The Secretary of Agriculture[27/] has directed an updated

25/ U. S. Department of Agriculture, 1962. Basic statistics of the national inventory of soil and water conservation needs. Statistical Bull. 317, U.S.D.A., Washington, D.C., 164 pp.

26/ U. S. Department of Agriculture, 1965. Soil and water conservation needs--a national inventory. Misc. Publ. 971, U.S.D.A., Washington, D.C., 94 pp.

27/ Freeman, Orville. 1965. Secretary of Agriculture, Memo 1396, dated March 25, 1965. Data for national inventory of soil and water conservation needs. (CNI).

and current inventory and projection of land uses to begin in 1965. The goal for completion of the new inventory is December 1967. It is now apparent that the original reports developed in 1958 and published in 1962 and 1965 underestimated the magnitude of the adjustments of rural land uses. The new preliminary forest survey statistics show an increase of well over a million acres of Pennsylvania forests between 1958 and 1965.28/

Industry does not consider the suggested loss of southern forest acreage as a limitation to their pulp and paper production in view of the massive industry shift to the South.29/ Vertical integration from forest land holdings to a broad line of end products is increasing, and the traditional large western lumber companies are moving into the pulp and paper field in response to the favorable market outlook for pulp and paper, both domestic and for European export.

The shift of people from the farms to the cities, and city dwellers invading the countryside have both contributed to the increase of forest area in the highly populated Northeast. As farms are abandoned or become country residences for urban workers, trees quickly take over the land by natural succession. The rural nonfarm population, whether it be subdivisions or individual estate or country homes, places unfavorable pressures on farmland in some cases, but encourages the invasion of trees and woodland.

28/ U. S. Forest Service. 1965. Preliminary forest survey statistics by counties. Pennsylvania. Northeastern Forest Experiment Station, Upper Darby. Multilith Report.

29/ Anonymous 1965. They see a market for all they can make, Business Week, No. 1875. McGraw-Hill Inc. pp. 50-53, August 7 issue.

In Megalopolis[30], extending from north of Boston to south of Washington, and including only the narrow coastal region of the states in the current inquiry, over half the land is forest--16.2 million acres--and the forests are increasing. Even New Jersey, one of the states with the highest human population density in the nation, is 46 percent forested.

The concern about timber scarcity at the turn of the century is being tempered somewhat in light of new knowledge and appraisals of reports on forest resources. Dr. Joseph L. Fisher, President of Resources for the Future, suggests that evidence is accumulating which may modify the outlook for a scarcity of timber in light of growth rates and technological changes within forestry and the likelihood of increased availability of low cost substitute materials.[31]

Zivnuska's analysis of the recent Forest Service Report points to the facts that since 1909 the annual timber cut has been estimated at approximately 50 billion board feet while forest growth has increased steadily. In 1909 growth was only 10 percent of cut but today growth exceeds cut by nearly 20 percent. This is a record of silviculture management success reflected in the increased growth, but one of marketing failure reflected by the rather uniform rate of cut which has been stagnated at about 50 billion board feet. He concludes that growth is greater than ever, and the physical inventory of wood is increasing.

30/ Von Eckhardt, Wolf. 1964. The challenge of Megalopolis. A Twentieth Century Fund Report. The Macmillan Company, New York. 126 pp.

31/ Fisher, J. J., 1964. Technological and social change and our forest resources. Proc. Soc. Am. Foresters. 1964. Washington, D.C., pp. 76-78

"However, this will not be a great economic resource for the nation unless it is accompanied by the function of contributing to a given end such as satisfying a want. Strong advances in marketing, capital investment, and in silvicultural management are all essential if the nation's timber is to constitute an expanding economic resource."32/

In discussing the role of forest resources of Appalachia, some of which lies in the study area, Yoho33/ points to the resource scarcity philosophy as being particularly inappropriate for dealing with distressed areas and for the forest resources of the region. He suggests that the resource scarcity doctrine be refuted by American forestry.

These reports on the forest resources have viewed only the timber and wood production aspects. However, forests are more than wood; they are watersheds, open space, wilderness, recreation lands and wildlife lands. Public need, interest, support, and action for obtaining these additional goods and services from forest lands are increasing in many parts of the country especially in the heavily populated Northeast.

Evidence of public policy and action are shown by the Wilderness Act, Land and Water Conservation Fund Act, PL 566 Watershed programs, Resource Conservation and Development projects, Open Space programs, River Basin Study and Development, and a variety of additional public projects designed to enable local, state and federal action to satisfy the needs of society for these additional uses of forest land resources.

32/ Zivnuska, J. A. 1964. The 1964 timber trends study in perspective. Proc. Soc. Am. Foresters. 1964. Washington. pp. 84-88.

33/ Yoho, J. G. 1965. The role of forestry in distressed areas. Proc. Allegheny Section Soc. Am. Foresters, Pittsburgh. pp. 2-9.

Pressures for these broader concepts of the use of forest resources will increase, rather than diminish, especially in the inquiry region of the Northeast.

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