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Forest Service Handbook 1909.17 – Economic and Social Analysis Handbook

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Economic and social analyses are integral parts of Forest Service planning and decisionmaking (FSM 1970.3). This handbook discusses how the policies and guidelines set forth in FSM 1970 Economic and Social Analysis should be used in the evaluation of the economic and social effects of policies, programs, plans, and projects. The objective of this handbook is to promote consistent use of economic and social analysis in resource plans, programs, and projects within the Forest Service.

This handbook is written to guide Forest Service economists, social scientists, planners, and analysts at the Washington Office, Regional Offices, Research Stations, and National Forests, and in cooperating organizations involved in joint planning of policies and programs. It is not intended as a replacement for functional economic handbooks, but rather as a vehicle to complement, supplement, and provide supporting material of a general nature that applies to all economic analyses.

01 - Authority

FSM 1970.1 outlines relevant authorities directing that economic and social analyses be conducted to aid Forest Service decisionmaking. Four in particular provide guidance on how such analyses should be made and used: (1) The Forest and Rangeland Renewable Resources Planning Act (RPA), (2) The National Forest Management Act (NFMA), (3) the Forest Service regulations to implement NFMA at 36 CFR Part 219, and (4) the National Environmental Policy Act (NEPA) and implementing regulations at 40 CFR Parts 1500-1508. The relevant texts of the laws are contained in Agriculture Handbook 453, the Principal Laws Relating to Forest Service Activities. The text of the planning regulations is in FSM 1010. The NEPA regulations are set out in FSH 1909.15.

05 - Definitions

Terms important to economic and social analysis are defined at 36 CFR 219.3, FSM 1905, in this section, and in section 30.5 of this handbook.

1. Analysis period, long-term. In an analysis, a time horizon of expenditures that is two or more 5-year Resources Planning Act (RPA) planning periods in duration. The RPA program, Regional plan, and Forest plan analyses have long-term periods.
2. Analysis period, short-term. In an analysis, a time horizon of expenditures that is only one or two years or less in duration. A budget analysis is short-term.
3. Asset.
 - a. Capital Asset. A natural resource, manmade structure, facility, or improvement in natural resources used as an input in production processes.

b. **Residual Asset.** The remaining value of a capital asset at the end of the time horizon of the planning or analytical process.

4. **Benefit.**

a. **Direct benefit.** A primary benefit that responds to specified objectives of the policy, program, project, or expenditure.

b. **Induced benefit.** A primary benefit that is incidental to the objectives of the policy, program, project, or expenditure.

c. **Net Public benefit.** See FSM 1905.

d. **Primary benefit.** A benefit accruing to resource owners from a primary output and that may be direct or induced or may be a residual asset. Primary benefits are components of net public benefits.

e. **Secondary benefit.** A benefit accruing to parties other than the resource owners, including effects on local, regional, and national economies and on consumers of outputs. Secondary benefits are not necessarily included in net public benefits.

5. **Benefit-cost ratio.** A measure of economic efficiency computed by dividing total discounted primary benefits by total discounted economic costs.

6. **Capital formation.** As used in IMPLAN is defined as the Value of purchases from sectors both inside and outside the region used by individuals, governments, and industries in the area as investment (land, plant, and equipment used in production processes).

7. **Capital investment.** Activities that create or improve capital assets to obtain benefits occurring during several planning periods.

8. **Complex planning action.** A planning action in which individual components of the alternatives require separate decisions (see FSM 1970.62).

9. **Costs.**

a. **Associated cost.** In functional analyses dealing with a specific resources or activity, an impact on the costs of other activities, including reduced or additional transportation and protection costs.

b. **Cost effectiveness.** See FSM 1905.

c. **Cost efficiency.** See FSM 1905.

- d. Direct cost. A cost that directly contributes to the production of the primary outputs of an activity, project, or program.
- e. Economic cost. Total fixed and variable costs for inputs, including costs incurred by other public parties and, if appropriate, opportunity costs and cost savings.
- f. Fixed cost. A cost that is committed for the time horizon of planning or the decision being considered. Fixed costs include fixed ownership requirements, fixed protection, short-term maintenance, and long-term planning and inventory costs.
- g. Investment cost. A cost of creating or enhancing capital assets, including costs of administrative or common-use transport facilities and resource management investments.
- h. Joint cost. A cost contributing to the production of more than one type of output.
- i. Non-Forest Service cost. A cost of investment and operating activities paid by cooperators or other non-Forest Service agencies which are part of Forest Service management programs, or which contribute to the outputs included in the analysis.
- j. Opportunity cost. The value of a resource's foregone net benefits in its most economically efficient alternative use.
- k. Separable cost. An identifiable portion of the costs of jointly used, manmade resources or services required by or contributing to only one objective or output.
- l. Site-specific cost. A cost (of resource management and investments) that reflects the specific conditions at individual sites or classes of resources.
- m. Transaction cost. The total economic cost incurred in acquiring inputs, including such costs as design, legal fees and permits, and transportation.
- n. Unit cost or cost per unit. Total cost of production divided by the number of unit produced.
- o. Variable cost. A cost that varies with the level of controlled outputs in the time horizon covered by the planning period or decisions being considered.

10. Decision unit. The smallest component of an alternative for which relevant inputs (costs) and outputs (benefits) are analyzed.

11. Demand analysis. A study of the factors affecting the schedule of demand for an output, including the price-quantity relationship, if applicable.

12. Direct coefficients. The value of inputs (or intermediate products) required by a producing industry from a selling industry to produce a dollar's worth of output. Also called technical coefficients or input requirements.

13. Discount rate, nominal. Discount rate expressed in terms of current dollars, and thus affected by the rate of inflation.

14. Discount rate, real. A discount rate adjusted to exclude the effects of inflation.

15. Economic efficiency. The usefulness of inputs (costs) to produce outputs (benefits) and effects when all costs and benefits that can be identified and valued are included in the computations. Economic efficiency is usually measured using present net value, though use of benefit-cost ratios and rates-of-return may sometimes be appropriate.

16. Economic impact.

a. Direct economic impact. Effects caused directly by forest product harvest or processing or by forest uses.

b. Indirect, economic impact. Effects that occurs when supporting industries sell goods or services to directly affected industries.

c. Induced economic impact. Effects that occur when employees or owners of directly or indirectly affected industries spend their income within the economy.

17. Employment. Labor input into a production process, measured in the number of person-years or jobs. A person-year is 2,000 working hours by one person working year long or by several persons working seasonally.

18. Evaluation. An assessment of policies, programs, plans, or projects based on economic and social measures.

19. Exports. As used in IMPLAN are defined as outputs or products produced but not consumed or used in production of other outputs in the impact area. Includes both exports to other areas of the U.S. and international exports.

20. Final demands. As used in IMPLAN are defined as the sum of all purchases for consumption by households, government, capital formation, or for export from the region. (The exports may be intermediate products in the regions to which they are exported.)

21. FORPLAN. A linear programming system used for developing and analyzing forest planning activities.

22. Good.

a. Merit good. An output deemed worthy by political process or by governmental authority of being provided to the public free, at a minimal charge, or at actual cost. Examples are free firewood, picnic grounds, recreation travel on roads, and hiking trails.

b. Nonmarket good. An output that is not normally exchanged for money in a market. Usually no market has evolved because ownership of the good is not clear, exclusive use is not possible under current laws, or it is not possible to consistently define the good.

c. Public good. An output for which it is impractical to impose a charge, either because it must be supplied to all if it is supplied to one or because the costs of collection and control exceed likely revenue.

23. Household consumption. Purchases of households in the area from producing industries in the region, and from other primary input sectors (households as wages and salaries, government services, and imports from outside areas). Also called personal consumption.

24. Impact analysis area. The delineated area subject to significant economic and social impacts from Forest Service activities included in an economic or social impact analysis.

25. Impact analysis subarea. The specific area within an analysis area that is subject to localized economic or social impact from Forest Service activities.

26. IMPLAN. A computer based system used by the Forest Service for constructing non-survey input-output models to measure economic input. The system includes a data base for all countries in the U.S. and a set of computer programs to retrieve data and perform the computational tasks for input-output analysis.

27. Imports. As used in IMPLAN are defined as purchases of products for use in production of other products and for final consumption from outside the impact area. Includes both imports from other areas of the U.S. and international imports. Competitive imports are the same as local domestic products which are not produced in quantities sufficient to meet local demands or which obtain a share of the local market formerly supplied by local producers. Noncompetitive imports are products not produced locally.

28. Income. Employee compensation, profits, rents, and other payments to households.

29. Incremental analysis. A comparison between the change in discounted benefits and the change in relevant discounted costs for each change in program or project size.

30. Industry. A class of firms engaged in raw material production, manufacture, or trade that produces homogenous or at least similar outputs or products using the same or similar production processes and inputs.

31. Interindustry transactions. The value of inputs (or intermediate products) required by purchasing industries within the area from selling industries within the area.

32. Intermediate products. Outputs or products produced in the area and used as inputs in the production process of another industry.

33. Investment.

a. Joint-use investment. Investments used to produce several benefits.

b. Resource management investment. Investments that improve natural resources (including land, vegetation, or animal populations) to increase future net benefits or to reduce losses in several planning periods.

34. Least-cost analysis. Determination of the least cost means of attaining specified results.

35. Lifestyle. The characteristic way people live, indicated by consumption patterns, work, leisure, and other activities.

36. Low income. Household income below the poverty level as defined by the U.S. Department of Health and Human Services. In 1988, this level was \$5,770 for a family of one and \$11,650 for a family of four.

37. Market. The processes of exchanging a good or service for money or other goods or services according to a customary procedure. A market may occur in a specific place or throughout an area by individual transactions.

38. Market area. The area from which a market draws or to which it distributes its goods or services and for which the same general price structure and price influences prevail.

39. Market assessment. A market study describing sources of supply and demand for a good or service, pricing processes, and influences on value.

40. Market subarea. Portions of a market area in which differences in local costs of production or transport affect price.

41. Minority. Persons as specified in Directive 15, Office of Federal Statistical Policy and Standards, U.S. Department of Commerce, Statistical Policy Handbook (1978). Specified minority groups include Blacks, American Indians/Alaska natives, Asian & Pacific Islander, and Hispanics.

42. Multiplier. A ratio of a measure of total change in income or employment to the direct income or employment change. The measure to total change may be direct plus indirect change (Type I Multipliers); or direct, indirect, and induced change (Type II Multipliers); or direct, indirect, and interactive increased induced demands based on population increase (Type III Multipliers).

43. Outputs.

a. Controlled output. The amount of an output which management has the legal and practical ability to control with management activities.

b. Direct output. An output that fulfills specified objectives of the policy, program, or project being evaluated.

c. Non-controlled output. The amount of an output which will occur regardless of management activity.

d. Joint outputs. Two or more outputs that are produced together in a production process.

44. Present net value, primary. The present net value which includes only the benefits and costs of producing primary outputs, and excluding secondary benefits.

45. Price. The unit value of an output expressed in dollars.

46. Price elasticity. A measure of the sensitivity of the quantity of a good or service exchanged to changes in price.

47. Primary inputs. Payments made in producing industries for inputs that are not outputs produced by local industries. They include employee compensation (wages, salaries, fringe benefits), property-type income (profits, rents, royalties, interest, dividends), indirect business taxes (excise, retail sales, and other taxes businesses have to pay when purchasing goods and services), and imports.

48. Production function. A quantitative description of the relationship between inputs and outputs in a production process.

49. Production process. A procedure that transforms inputs into outputs.
50. Programmatic analysis. Evaluation conducted at the Forest or program level considering sets of activities or projects to accomplish objectives, defined in terms of specific results and responsibilities for accomplishments.
51. Project. See FSM 1905.
52. Quality of output. The usefulness or desirability of a good or service, expressed as a physical measure, index, or grade.
53. Rate-of-return. The financial yield per unit cost determined as the rate of interest at which total discounted benefits equal total discounted costs. (Internal rate-of-return is a similar measure appropriate to the benefits and costs that affect private firms or individuals.)
54. Receipt sharing. The sharing of receipts received from resource management with State and county governments, such as the Forest Service 25 percent fund payments.
55. Schedules.
- a. Benefit and cost schedule. List of the sequence of benefits and costs over time.
 - b. Input and output schedule. List of the sequence of management activities and outputs over time.
56. Short-term evaluation. Evaluation of a plan or project for a limited time period, at the end of which the residual assets still retain a significant present net value.
57. Stage of production. One of several production processes in a series that converts raw materials into final goods or services used by consumers.
58. Structural change. Change in composition or mix of economic and social activities or industries.
59. Tax. As used in IMPLAN is defined as an obligatory payment to a government that goes into a fund for general governmental support purposes. Taxes do not include social security and other employment insurance, or other payments for benefits received directly by the payer.
60. Technology change. A change in the relationship between inputs and outputs in a production process resulting from the implementation of new technology, or a new application of existing technology.

61. Time horizon. Time limit for planning or evaluation.
62. Time period. Interval of time in a production process.
63. Underemployed. Unemployed persons not actively seeking employment but who would, given the opportunity. This also includes persons employed part-time who could work full-time, and persons who are capable of doing work with higher requirements.
64. Unemployed. Not employed but actively seeking employment.
65. Value.
- a. Market value. The unit price of an output normally exchanged in a market after at least one stage of production. Market value is expressed in terms of prices as evidenced by market transactions.
 - b. Nonmarket value. The unit price of a nonmarket output normally not exchanged in a market at any stage before consumption; it is thus necessary to impute nonmarket value from other economic information.
66. Value added. The sum of employee compensation, indirect business taxes, and property type income. Value added is essentially the income accruing to society when an output is produced and sold.
67. Value analysis. An analysis to determine the basic function of a proposal and how to accomplish what the lowest total cost.