

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188
Exp. Date: Jun 30, 1986

1a. REPORT SECURITY CLASSIFICATION Unclassified		1b. RESTRICTIVE MARKINGS	
2a. SECURITY CLASSIFICATION AUTHORITY		3. DISTRIBUTION /AVAILABILITY OF REPORT Approved for public release; distribution unlimited	
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE		5. MONITORING ORGANIZATION REPORT NUMBER(S)	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) IWR Report 89-R-1		7a. NAME OF MONITORING ORGANIZATION	
6a. NAME OF PERFORMING ORGANIZATION Water Resources Support Center Institute for Water Resources	6b. OFFICE SYMBOL (if applicable) CEWRC-IWR	7b. ADDRESS (City, State, and ZIP Code)	
6c. ADDRESS (City, State, and ZIP Code) Casey Building, #2594 Fort Belvoir, Virginia 22060-5586		9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8a. NAME OF FUNDING/SPONSORING ORGANIZATION U.S. Army Corps of Engineers	8b. OFFICE SYMBOL (if applicable)	10. SOURCE OF FUNDING NUMBERS	
8c. ADDRESS (City, State, and ZIP Code) Washington, D.C. 20314-1000		PROGRAM ELEMENT NO.	PROJECT NO.
11. TITLE (Include Security Classification) A Review of the U.S. Army Corps of Engineers Selection and Evaluation Process for Water Resources Development		TASK NO.	WORK UNIT ACCESSION NO.
12. PERSONAL AUTHOR(S) Hansen, William J. and Bright, Laurie C.			
13a. TYPE OF REPORT	13b. TIME COVERED FROM _____ TO _____	14. DATE OF REPORT (Year, Month, Day) 89 March 31	15. PAGE COUNT
16. SUPPLEMENTARY NOTATION Available from National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161			
17. COSATI CODES		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	Water Resources Development Evaluation, Rural Bias, Income Bias	
19. ABSTRACT (Continue on reverse if necessary and identify by block number) The report presents findings from a review of the U.S. Army Corps of Engineers' selection and evaluation criteria for water resources development projects. The review was requested by Congress in Section 719 of the Water Resources Development Act of 1986 (PL-662). The report identifies the importance of various factors in the selection and evaluation process and their potential bias against rural areas and areas with greater percentages of low-income individuals. Findings are based on a conceptual review and a survey of 489 Corps studies and projects in various stages of the selection and evaluation process.			
20. DISTRIBUTION /AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS		21. ABSTRACT SECURITY CLASSIFICATION Unclassified	
22a. NAME OF RESPONSIBLE INDIVIDUAL William J. Hansen		22b. TELEPHONE (Include Area Code) (202) 355-3089	22c. OFFICE SYMBOL CEWRC-IWR-R

**A REVIEW OF THE US ARMY CORPS OF ENGINEERS SELECTION AND
EVALUATION PROCESS FOR WATER RESOURCE DEVELOPMENTS**

**A Study Conducted in Response to Section 719 of the Water Resources
Development Act of 1986**

by

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March 1989

IWR Report 89-R-1

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EXECUTIVE SUMMARY

PURPOSE AND SCOPE

The study was directed by Section 719 of the Water Resources Development Act of 1986 (Public Law 99-662). The objectives of this study were: to identify factors that affect the evaluation and selection of COE projects, and to determine if such evaluation and selection criteria are biased against rural areas or areas with greater percentages of low-income individuals. The study effort consisted of a literature and conceptual review of project evaluation and selection criteria, and a survey of 489 COE studies and projects. Both quantitative demographic data and qualitative views and opinions were included in the survey. The studies and projects were from various stages (i.e., Reconnaissance, Feasibility, Authorized, and Construction) of the COE evaluation and selection process.

FINDINGS

The conceptual review of the evaluation and selection criteria indicates that there is an inherent process bias in the COE evaluation procedures against both rural areas and areas with greater percentages of low-income individuals. The COE evaluation criteria (i.e., efficiency) is governed by the U.S. Water Resources Council's Environmental Principals and Guidelines for Water and Related Land Resources Implementation Studies. The principal efficiency criterion is based on the concept of "willingness to pay" and on maximizing National Economic Development (NED) benefits. Under such an evaluation concept, when considering, for example a flood control project, wealthier individuals with more expensive homes would receive more benefits, from the same level of protection, than low-income individuals with less expensive homes. Similarly, there is usually more and higher valued property per acre in urban areas than in rural areas. Therefore, urban areas would likely receive more benefits per acre than rural areas for the same level of flood protection.

The inherent process bias in the evaluation criteria against low-income areas, however, is not manifested in recent COE report and funding recommendations. Findings of the demographic survey indicate that there is no statistical difference in the distribution of income measures between flood control studies and projects receiving favorable, versus unfavorable, recommendations. Similar results were found when comparing the demographics for all studies and projects (i.e., not just those providing, primarily, flood control benefits).

Program and budget priorities established by the COE have significant influence in the selection process and are biased against rural areas and areas with greater percentages of low-income individuals. The two most frequently cited reasons for studies and projects not receiving favorable report or funding recommendations were insufficient benefit-to-cost ratio and inconsistency with the COE program and budget priorities. Prior to authorization for construction, the benefit-to-cost ratio

was identified as the most important factor in unfavorable report recommendations. However, after a project has been authorized by Congress, the most important reason cited in decisions for unfavorable funding recommendations was inconsistency with the COE program and budget priorities which emphasize, primarily, flood control and navigation projects. With such an emphasis on flood control and navigation projects, which tend to be located in more urban areas, a bias against rural areas and areas with higher percentages of low-income individuals results. This bias is likewise manifested in the demographic analysis of the surveyed projects and studies. Projects not emphasized, that is projects that provide, primarily, such benefits as hydropower, water supply, and recreation, tend to be located in more rural areas and areas with greater percentages of low-income individuals.

Findings from this study further indicate that changing or eliminating COE efficiency criteria for project evaluation would likely not significantly alter the percentage of favorable studies or projects that would be located in areas with greater percentages of low-income individuals. Changes in program or budgetary priorities, however, could increase the percentage of studies and projects receiving favorable report and funding recommendations, both in rural areas and in areas with greater percentages of low-income individuals.

CHAPTER I

INTRODUCTION

The Water Resources Development Act of 1986 (WRDA-86) (PL 99-662), signed into law November 17, 1986 by President Reagan, began a new era for the US Army Corps of Engineers (COE) Civil Works Program. It forged a new charter with non-federal interests for future water resource developments. Cost sharing requirements and local user fees established in the law ensured that non-federal interests will play an important role in planning, financing, and maintaining COE water resource development projects.

Concomitantly, Congress expressed a concern in WRDA-86 that certain segments of the populace not be excluded from participating in COE water resource developments. Specifically, Section 719 of the WRDA authorized the Secretary of the Army to ". . . direct and conduct a study of the Army Corps of Engineers project selection and evaluation criteria identifying all factors which affect the selection of flood control or other projects under the Secretary's authority in rural areas and in areas with greater percentages of low-income individuals" (PL 99-662). As part of this study, ". . . specific recommendations in the selection criteria that would effectively eliminate any bias against any projects in such areas. . ." are to be developed and transmitted to Congress (PL 99-662).

BACKGROUND

Intuitively, when looking singly at the benefit-cost procedures by which flood control projects are evaluated, a potential for bias against poorer or more rural areas does exist. That is, when considering national economic development, the COE's benefit-cost methodology stresses the value of property protected when deriving potential benefits for flood damage prevention projects. Other things being equal, a wealthier area will have higher property values (including the value of structures and contents), than a poorer area, and thus be more able to justify a flood damage prevention project. Similarly, urban areas tend to have more potentially damageable property per acre than rural areas. Thus, when simply considering levels of expenditure per household or per acre, wealthier and more urban areas have a greater potential for justifying flood damage prevention investments, based on national economic development criteria.

However, although stressed by the COE (Steinberg, 1984), benefit-cost analysis is just one element in a complex and dynamic selection and evaluation process. As noted by Allee and Ingram:

The processes of authorization and appropriations involve a dizzying number of individuals and groups which are engaged in making choices in a maze of separate settings. What Congress votes on and the President signs is conditioned by the kind of projects which are initiated,

studied, planned and supported before they reach the national political arena for consideration. Before a project reaches that point it may have been considered alternatively at local and national levels many times. (Allee and Ingram, 1972)

Thus, any review of the COE selection and evaluation criteria cannot simply focus on the procedures and products of benefit-cost analysis. Consideration must also be given to other important factors which influence the project formulation and selection processes, including local needs and interests, legislative actions, and administrative policies. While a project goes through iterative local and national level reviews, the importance of many of these factors may change, not only in response to changes in the problems and needs of the local area, but also to those of the nation.

As an example, the COE's national flood control program was initiated with the Flood Control Act of 1936 (PL 74-738). With this act Congress acknowledged ". . . a genuine nationwide need for increased Federal flood control assistance to include larger structures such as dams and reservoirs (Whitten, 1984)." The selection criteria for such projects included, ". . . if the benefits to whomsoever they may accrue are in excess of the estimated costs . . . (PL 74-738)," indicating a concern for efficiency analysis. The Flood Control Act also came during a period of severe unemployment. Holmes identifies the 1933-43 period as the "New Deal" era of water resources planning, during which ". . . water resource planning was based on the need for immediate action in the form of public works projects to stimulate construction industries and provide jobs for the unemployed (Holmes, 1972)." Although efficiency (in terms of benefits exceeding costs) was a criterion to be considered in project evaluation, regional development (equity) in the form of the creation of new jobs was also a primary concern of the selection process.

Today, the water resources planner is faced with an entirely different economic and political environment. "The reality of budgeting pressures has given life to the long-recognized arguments for changing Federal water financing policy (Sickles, 1986)." With respect to these changes, the Conservation Foundation recently observed:

Yet this is not so strange when one compares the historical rationales for federal intervention in water resources with the contemporary situation. . . . the driving theme (behind federal involvement) usually was regional development, and the method of achieving it was a substantial or nearly total financial subsidy of program beneficiaries.

As debates on the advisability of continuing traditional water-development policies rage on, there is little dispute about the political reasons behind the present stalemate: the long-standing national consensus in favor of subsidizing regional development by water spending has disappeared. (Conservation Foundation, 1984)

The current political and economic climate have led to greater emphasis on national economic development criteria under both the Carter and Reagan administra-

tions. The policy of greater non-federal participation reflected in the WRDA of 1986 also reflects a greater emphasis on efficiency criteria. As noted by Sickles:

The lower the cost of the project to direct beneficiaries, the larger the incentive to overbuild. Left alone, and assuming adequate resources, a community may respond to its water problems by considering less costly alternatives. Therefore, by giving beneficiaries a larger stake in the project, wiser investment decisions are foreseen. (Sickles, 1986)

Thus, it can be seen that since passage of the Flood Control Act in 1936, there has been a change in the emphasis on certain selection and evaluation factors. Although Congress acknowledged a need for a change in the planning and financing of water resource developments with the passage of WRDA-1986, the language of Section 719 expresses a concern that these changes not be biased against certain segments of the population.

PURPOSE AND SCOPE

The purpose of this study is to determine if recent study findings and/or funding allocations made under current selection and evaluation criteria, (emphasizing national economic development and increased non-federal participation), are biased against rural areas or areas with higher proportions of low income individuals. If biases are identified, factors contributing to them are to be identified so that recommendations for improvements can be made.

In order to reflect recent changes in water selection and evaluation policies, this study is limited to Reconnaissance and Feasibility studies completed since the beginning of FY 1985, and to Authorized and Construction projects identified in the COE's testimony at the FY 1988 Budget Appropriations Hearings (described in greater detail in Chapter III).

This study differs from previous reviews in several ways. For one, it is not limited to flood control and navigation projects, but is considering all project outputs. Another difference is that the study addresses all stages of the COE's evaluation and selection process, that is Reconnaissance, Feasibility, Authorization, and Construction. Comparisons of favorable and unfavorable studies (or funded and non-funded projects) will be made at each of these stages.

Comparisons will not only be of the demographic characteristics of the affected areas, but also of other selection and evaluation factors (e.g., benefit-cost ratio or support of local sponsor) that potentially influenced the report finding or funding decision. Comparisons will also be made between projects at various stages of the planning process. The objective is to determine whether or not project characteristics change in terms of such factors as areas affected or project outputs as they move through the selection and evaluation process. Finally, demographic comparisons will be made both in terms of direct beneficiaries (i.e., floodplain areas) and of

economic impact areas (i.e., the county(ies) in which studies or projects would be located).

PREVIOUS REVIEWS

In an early review of the COE evaluation and selection process, Haveman (1965) identified three broad forces which interact to affect the allocation of construction appropriations: 1) economic efficiency, 2) regional economic aid or income redistribution (i.e., equity), and 3) political manipulation. Although economic efficiency and equity can sometimes be in conflict, Haveman found both were at least partially addressed in the selection of COE projects. By comparing benefit-cost ratios of all projects authorized in the 1960 Omnibus Bill with those that were also selected as 1962 New Construction Starts, he concluded, ". . . that efficiency, in some vague way, does take its place among the nebulous set of criteria for choice among alternatives . . . a claim which can be made for no other sizable Federal government spending program (Haveman, 1965)."

With respect to equity, Haveman compared total state per capita appropriations for navigation and flood control projects for the 1946 through 1962 period, with state annual per capita income. He found that, "Not only were the ten states receiving the largest appropriations found to cluster largely in the lowest income region of the country, the South, but a fairly close inverse relationship between per capita income and per capita appropriations was found when all 50 states were considered (Haveman, 1965)."

In a more recent review, Steinberg (1984) focused on the impact of policy changes on the COE's flood damage prevention program that occurred during the 1970 through 1983 time period. He noted that the external forces of the environmental movement (this was the period immediately following the passage of the National Environmental Protection Act (NEPA) in 1969) and large budget deficits were responsible for many of the policy changes that occurred during this period. The outcomes of these policy changes were analyzed and evaluated against the criteria of efficiency, equity, and responsiveness. Efficiency and equity are portrayed as being at opposite ends of an evaluation spectrum, being pulled to the center by responsiveness (Steinberg, 1984).

Steinberg notes that the post-NEPA era was plagued by a lack of clear-cut policy enacted into law or otherwise agreed upon by the executive and legislative branches. "Most notable have been attempts to increase the non-Federal share of the cost of flood damage prevention projects, the stressing of environmental quality and non-structural solutions during the planning process, and the promulgation of rules which make the economic justification of flood damage prevention projects more difficult (Steinberg, 1984)." He indicates the latter was most seriously affected by higher discount rates and more stringent rules on benefit calculations.

As part of his review, Steinberg compared demographic characteristics of the nearly 200 flood damage prevention projects selected as new starts between 1968 and 1983 with those of approximately 70 recommended projects that were then undergoing Washington level review. The comparisons indicated relatively minor differences in the average wealth of the jurisdictions which received a new start versus those awaiting authorization. However, when a similar comparison was made between the nearly 200 1968-83 new starts and eight local protection flood damage protection new starts proposed by the administration for Fiscal Years 1983 and 1984, a different conclusion was reached. In this case, communities to be served by the 1983 and 1984 proposed new starts were shown to be wealthier than those served by the older projects (Steinberg, 1984).

The 1983 and 1984 proposed new starts were projects for which local sponsors had agreed to pay a higher non-federal share than previously required. They reflected the Reagan administration's solution for moving ahead with new construction starts while minimizing the impact on the federal deficit by proposing higher non-federal cost sharing and up-front financing (Steinberg, 1984). While noting the small number of projects in the universe, Steinberg concludes, ". . . that, all other things being equal, willingness to pay a share greater than lands easements, and rights-of-way favors more wealthy communities . . . (Steinberg, 1984)."

OVERVIEW OF REMAINDER OF REPORT

An overview of the COE's project evaluation and selection process is presented in Chapter II. This is not intended to be a detailed discussion of the COE's evaluation guidelines and planning process, but rather a highlighting of key criteria and factors that influence project evaluation and selection.

The primary data base used for the analysis reported herein was developed from a survey of COE studies and projects in various stages of the evaluation and selection process. The various sources of study and projects listings and the rationale for those to be included in the survey are described in Chapter III. Also described in Chapter III is the development and implementation of the survey questionnaire. The analysis of data and findings from the survey questionnaire are presented in Chapter IV, and study conclusions are presented in Chapter V.

CHAPTER II

EVALUATION AND SELECTION PROCESS

PURPOSE

As noted in the Introduction, the COE project evaluation and selection process is a complex and multi-faceted one, involving ". . . a dizzying number of individuals and groups which are engaged in making choices in a maze of separate settings (Allee and Ingram, 1972)." The purpose of this chapter is to briefly summarize this process and identify some of the key formulation and other factors which influence the evaluation and selection of COE water resource projects. The perceived importance of these procedures and factors in recent COE studies and funding decisions, and potential selection biases that may have resulted, will be analyzed in subsequent chapters.

OVERALL SELECTION AND EVALUATION PROCESS

The COE pamphlet, "Six Steps to a Civil Works Project," summarizes the planning, design, and implementation process as follows:

Step 1 Problem Perception

Local community (i.e., people, businesses) and/or local government perceive or experience water and related land resource problems (i.e., flooding, shore erosion, navigation restrictions, etc.). Problems are beyond local community's/government's capabilities (e.g., jurisdictional boundaries, financial resources, technical expertise, etc.) to alleviate or solve.

Step 2 Request for Federal Action

Local officials talk to Corps about available federal programs. Technical assistance and some small projects can be accomplished without congressional authorization.

Local officials contact congressional delegation if study authorization required.

Member of Congress requests study authorization through Public Works Committees.

Committee resolution adopted if report was previously prepared on water problems in area.

Legislation, which may be proposed by the President, is normally required if no Corps report exists.

Step 3 Study Problem and Report Preparation

Study is assigned to Corps district office.

Funds to complete 12-18 months reconnaissance phase are included in President's budget.

Appropriations for reconnaissance provided in annual Energy and Water Development Appropriations Act.

District conducts reconnaissance phase, leading to reconnaissance report.

Because most Corps projects involve cost sharing and environmental issues, local proponents should seek an early consensus for or against a Corps project among the public and private sectors and among diverse interest groups.

If study continues beyond reconnaissance phase, local sponsor must agree to share cost of feasibility phase.

Public involvement is an integral part of planning process, including review of draft report and draft environmental impact statement (EIS).

Study is conducted under the U.S. Water Council's Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, dated March 10, 1983.

Funds are included annually in President's budget; annual appropriations and non-federal monies are needed to continue study.

Study results in Definite Project Report and EIS which are submitted to Corps division (regional) office.

Step 4 Report Review and Approval

Division office, which reviews district work during planning process, completes technical review of final district Definite Project Report and EIS.

Division engineer submits report to review board or commission and issues public notice inviting comments.

Board of Engineers for Rivers and Harbors (BERH) or Mississippi River Commission (MRC) conducts review of report and submits views and recommendations to Chief of Engineers.

Comments from public are fully considered in BERH or MRC action.

Proposed report of Chief of Engineers and final EIS are sent to heads of federal agencies and governors of affected states for comment.

Final EIS is filed with Environmental Protection Agency (EPA) and made available to public.

Chief of Engineers considers comments on proposed report and EIS, prepares final report, and submits it to Secretary of the Army.

Chief of Engineers' report is reviewed by Assistant Secretary of the Army (Civil Works).

Office of Management and Budget (OMB) comments on report as it relates to President's programs.

Assistant Secretary of the Army (Civil Works) transmits Chief of Engineers' report to Congress.

In some cases, Corps continues planning and design pending congressional authorization of proposal. This process is called CP&E. Funds are included in President's budget and Congress acts on each item in appropriations bill.

In other cases, planning and design are terminated when district completes its Definite Project Report (Step 3) and must be reinitiated through budget and appropriations process following congressional authorization. This process is called AE&D.

Division offices and, in some cases, Office of the Chief of Engineers review continuing planning and engineering reports.

Step 5 Congressional Authorization

Chief of Engineer's reports (see Step 4) are referred to Committee on Public Works and Transportation in House and Committee on Environment and Public Works in Senate.

Civil works projects are normally authorized by Water Resources Development Act (Omnibus Bill) following committee hearings.

Occasionally, Corps proposal is authorized by separate legislation or as part of another bill or, in cases where estimated federal cost is \$15 million or less, by committee resolution.

Step 6 Project Implementation

New projects are included in President's budget based on national priorities and anticipated completion of design and plans and specifications so that construction contract can be awarded.

Budget recommendations are based on evidence of support by state and ability and willingness on non-federal sponsors to provide their share of project cost.

Congress appropriates federal share of funds for new starts; normally, this occurs in annual Energy and Water Development Appropriations Act.

Secretary of the Army and appropriate non-federal sponsors sign formal agreement once Congress has appropriated funds for project implementation to begin.

Agreement obligates non-federal sponsors to participate in implementing, operating and maintaining project according to requirements established by Congress and administration.

District completes enough engineering and design for developing plans and specifications for initial project implementation.

Engineering and design continue during implementation process; plans and specifications are reviewed by division offices and sometimes by Office of the Chief of Engineers.

Funds are included in President's annual budget for the federal share of the project; appropriations are required to continue design and implementation.

Construction is managed by Corps, but done by private contractors.

Most projects are operated and maintained by non-federal sponsors as part of agreement signed prior to implementation. However, funds are requested in President's annual budget for the federal share where there is a need for continuing federal financing of project operation and maintenance; congressional appropriations are required for such funds.

Corps periodically inspects projects, including those for which non-federal sponsors have assumed an operation and maintenance responsibility. (COE, 1987)

As can be seen from the above, the planning, design and implementation of COE Civil Works Projects requires extensive analysis and review and the involvement of

many different publics and government officials at various levels. For the purpose of this study, these various factors are grouped into four general categories for further analysis. These include: 1) evaluation guidelines; 2) local participation; 3) Congressional involvement; and 4) program and budgetary priorities. Each of these categories is briefly described below; their perceived importance in the evaluation and selection process, as well as potential contributions to selection biases, is analyzed in Chapter IV.

EVALUATION GUIDELINES

As noted in Step 3 above, studies are to be conducted under the U.S. Water Resources Council's Principles and Guidelines. Under the Principles and Guidelines, there is one federal objective for water resources planning; to contribute to national economic development while protecting the nation's environment (COE, 1987). When recommending a plan, the alternative with the greatest net economic benefits, consistent with protecting the nation's environment, is normally selected, although an exception may be granted by the Secretary of the Army (COE, 1987).

When the objective is to maximize net economic benefits, the emphasis is on changes in the economic value of the national output of goods and services. The general measurement standard used to value these changes is defined as the willingness of users to pay for each increment of output from a plan. "Such a value would be obtained if the 'seller' of the output were able to apply a variable unit price and charge each user an individual price to capture the full value of the output to the user (U.S. Water Resources Council, 1983)." This evaluation does not distinguish between the rich and the poor. Benefits are measured ". . . to whomsoever they may accrue (PL 74-738)," and a dollar of increased goods or services accrued by the wealthy contributes the same to project benefits as one accrued by the less well to do.

The federal objective of contributing to national economic development emphasizes maximization (efficiency), rather than the incidence (equity), of benefits. Although it does not distinguish between the recipients of benefits, it also does not distinguish between how many benefits different individuals may receive. For example, as noted in Chapter I, the COE evaluation procedure for estimating flood damages prevented is based on property values. That is, the willingness of an individual to pay for protection from flood damage (i.e., the benefit) is assumed to equal the damages prevented. Other things being equal, a wealthier individual with a more expensive home would be willing (and able) to pay more (i.e., would receive more benefit) for the same level of flood protection than a poorer individual with a less expensive home. A similar comparison can be made between urban and rural areas. There is usually more potentially damageable property per acre in urban than in rural areas. Again, other things being equal, urban areas are, therefore, willing to pay more (i.e., would receive more benefit) for the same level of flood protection per acre than rural areas.

Although the Principles and Guidelines emphasize national economic development as the federal objective, it also encourages providing information to decision makers on other project impacts, such as the incidence of benefits. The Principles and Guidelines established four accounts to facilitate evaluation and display of the effects of alternative plans. The National Economic Development (NED) account is the only required account and is used to show effects on the national economy. The Environmental Quality account is used to show effects on ecological, cultural, and aesthetic attributes of significant natural and cultural resources that cannot be measured in monetary terms. The Regional Development account is used to show the regional incidence of NED effects, income transfers, and employment effects. The Other Social Effects account is used to show urban and community impacts and effects on life, health and safety (U.S. Water Resources Council, 1983).

The primary objective of the system of accounts is to provide decision makers with information on impacts other than national economic development, so that other factors can be included in the evaluation and selection process. The COE, however, ". . . continues to use national economic efficiency as the yardstick by which projects are justified, whereas Congress, as well as professional public administrators, has called for a broader base by which to evaluate such programs (Steinberg, 1984)." One question to be addressed in Chapter IV then, is whether or not this emphasis on efficiency benefits has led to systematic bias against rural areas or areas with greater proportions of low-income individuals.

It should also be noted that under the Principles and Guidelines, project outputs are usually evaluated assuming a full employment economy. One exception is the use of unemployed or underemployed labor resources during plan implementation. That is, if the proposed project is to be constructed in an area with substantial and persistent unemployment, ". . . and these labor resources will be employed or more effectively employed in installation of the plan, the net additional payments to the unemployed and underemployed resources are defined as a benefit (U.S. Water Resources Council, 1983)." Thus, an additional benefit category is considered in the efficiency analysis in areas with substantial and persistent unemployment, which would tend to be areas with greater proportions of low income individuals. Again, a potential for bias in the selection process exists, but in this instance it would be in favor of areas with greater proportions of low-income individuals.

LOCAL PARTICIPATION

The COE project development and implementation process has always been characterized by a high degree of coordination and public involvement. As summarized above, this process begins with local identification of a water and related land resource problem (Step 1) and continues through the assumption of operation and maintenance by a non-federal sponsor after project implementation (Step 6). Local participation includes public involvement in problem identification and plan formulation, as well as the provision of all of the necessary assurances and commit-

ments to cost-sharing for planning, construction, and operation and maintenance by a local sponsor.

The passage of the WRDA of 1986 required an increased commitment to shared project development responsibilities (Directorate of Civil Works, 1988). Proposed projects must not only be responsive to local needs, but also must be acceptable in terms of the financial participation now required of local sponsors. One concern expressed at a series of regional workshops held for water development professionals to share ideas on new cost sharing and related issues was that:

. . . in some cases, a project with maximum net national economic development benefits may be - because of institutional or market reasons - unable to meet a financial feasibility test. The scope of the NED plan or the risks associated with a plan element may prevent non-Federal borrowing to finance that plan, but a non-optimal plan or down-scaled project may be financeable. Some workshop participants expressed concern that insistence on a NED plan which fails to meet the financial market test may lead to no project at all, and, consequently, no economic benefits. (Interstate Conference on Water Problems, 1985)

Although the Principles and Guidelines emphasize national economic development, all plans, including the NED plan, are to be formulated in consideration of four criteria: completeness, effectiveness, efficiency, and acceptability. These four criteria are defined in the Principles and Guidelines as:

- (1) Completeness is the extent to which a given alternative plan provides and accounts for all necessary investment or other actions to ensure the realization of the planned effects. This may require relating the plan to other types of public or private plans if the other plans are crucial to realization of the contributions to the objective.
- (2) Effectiveness is the extent to which an alternative plan alleviates the specified problems and achieves the specified opportunities.
- (3) Efficiency is the extent to which an alternative plan is the most cost effective means of alleviating the specified problems and realizing the specified opportunities, consistent with protecting the environment.
- (4) Acceptability is the workability and viability of the alternative plan with respect to acceptance by State and local entities and the public and compatibility with existing laws, regulations, and public policies. (US Water Resources Council, 1983)

The flexibility inherent in these statements provides some capability for addressing local concerns of financial feasibility and ability to pay, which are especially relevant in rural areas and areas with greater percentages of low-income individuals. As Sickles (1986) concluded, "The acceptability criteria is assumed to include the consideration of the financial capabilities of local sponsors." Present COE guidance indicates that NED criteria are to be used in scaling and scoping of the recom-

mended project, ". . . except as modified by non-Federal financial resource limitations . . . (EC 1105-2-188, Project Review and Approval Procedures)." In addition, in response to Section 103(m) of the WRDA of 1986 (P.L. 99-662), the COE has implemented a rule which allows for a reduction in the non-federal cost-share of flood control projects for areas which qualify under a special "ability to pay" determination.

CONGRESSIONAL INVOLVEMENT

As with local participation, Congressional involvement is an important part of the COE selection and evaluation process. Congress provides both the authorizations and appropriations necessary to conduct the various studies that ultimately lead to project implementation. This involvement, again, begins early in the process with an initial authorization (or committee resolution) for federal action (Step 2) and continues through implementation (Step 6). In addition to the formalized authorization and appropriation processes, individual Congressmen or Congressional delegations often work closely with project sponsors or supporters to ensure the COE is responding to local problems and needs and that study funds are allocated in a timely and efficient fashion.

Congressional involvement can also include Congress specifically directing the COE to conduct a study or implement a project that, otherwise, would not be recommended, based on COE selection and evaluation criteria. An example is the Tug Fork Valley, Kentucky and West Virginia Project. Based on traditional economic analysis there was little likelihood that a flood control project would have been recommended for this area. Factors contributing to the inability to justify a project included:

1. The geography of the region is one of narrow valleys and steep hills requiring high levees and floodwalls for adequate protection. This makes the construction rather expensive.
2. The areas subject to flooding were low income areas with the average value of housing well below the national average. This has a bearing on the quantification of flood damage prevention benefits and the ability of the communities to pay the non-Federal share of construction costs.
3. The continued rise in the discount rates under which the Phase I studies were conducted had a further detrimental impact on the benefit-cost ratio. (Steinberg, 1984)

Although a flood control project could not be justified based on traditional economic analysis, Congress authorized a project in the Energy and Water Development Appropriations Act of 1981, declaring:

Sec 202.(a)The Secretary of the Army, acting through the Chief of Engineers, is authorized and directed to design and construct, at full Federal Expense, such flood control measures at or in the vicinity of-

- (1) Pikesville, Kentucky, and of Grundy, Virginia, on the Levisa Fork of the Big Sandy River,
 - (2) Pineville, Kentucky, on the Cumberland River, and
 - (3) Williamson and Matewan, West Virginia, on the Tug Fork of the Big Sandy River, as the Chief of Engineers determines necessary and advisable to afford these communities and other flood damaged localities and their immediate environs on both the Levisa and Tug Fork of the Big Sandy River and Cumberland River a level of protection against flooding at least sufficient to prevent any likelihood of flooding such as occurred in April 1977, at an estimated cost of \$284,000,000.
- (c) The Congress finds that the benefits attributable to the objectives set forth in section 209 of the Flood Control Act of 1970 exceed the cost of the flood control measures authorized by this section. (PL 96-367)

This project is currently under construction.

PROGRAM AND BUDGET PRIORITIES

Typically, there are more studies and projects authorized than can be undertaken because of budgetary and manpower constraints. Criteria for selecting which projects will be funded are developed from Presidential program and other budgetary priorities. For example, preliminary screening criteria for selecting new start Feasibility and Planning and Engineering studies for the FY 88-92 program and budget included the types of needs to be addressed. That is, new start Feasibility studies were to address at least one of the following purposes - commercial navigation, flood damage reduction, or hydropower additions to authorized or completed projects. New start Planning and Engineering studies were to have net NED benefits at an 8 7/8 percent discount rate from the following purposes: commercial navigation, flood control, municipal and industrial water supply, or hydropower (EC 11-2-152).

There are two important aspects of these program and budgetary priorities. First, they usually emphasize the selection of studies and projects addressing a limited number (sometimes referred to as mainline) of the outputs that can potentially be addressed by COE water resource developments. In addition, they usually become more restrictive as studies and projects move through the selection and evaluation process. For example, as described above, the criteria for the Feasibility stage was the study would address a specified set of outputs, while for the Authorized stage the studies had to have net NED benefits for specified outputs. Again, the perceived importance of such prioritization on the selection and evaluation process, as well as any potential bias that may result, will be addressed in Chapter IV.

CHAPTER III

SURVEY POPULATION AND QUESTIONNAIRE

APPROACH

As noted in the Introduction, the primary data base for this study was a survey of recently completed Reconnaissance and Feasibility studies and projects in the Authorized and Construction categories. The objective of the survey was to take a "snapshot" picture, comparing demographic characteristics of those studies and projects receiving favorable report or funding decisions (i.e., selected for further study or funding) with the similar demographic characteristics of those receiving unfavorable decisions. The premise was that if biases against poor or rural areas were present, a difference would be manifest in such demographic indicators as income and housing value.

Comparisons were to be made at each stage (e.g., favorable versus unfavorable Reconnaissance studies), as well as between stages (e.g., Reconnaissance versus Construction). The comparisons within stages would indicate if there was a systematic bias in the selection and evaluation process against projects in rural areas or areas with greater percentages of low-income individuals. The comparisons between stages would indicate whether or not there was a change in the demographics of the affected areas as projects moved through the selection and evaluation process. Following is a more detailed discussion of the identification of the survey population and the development and implementation of the survey questionnaire.

SURVEY POPULATION

This study is limited to Implementation studies and projects being considered under the COE General Investigations Program. Reconnaissance and Feasibility studies to be included in the survey population were identified from lists maintained by the Planning Division, Office Chief of Engineers (CECW-PM) of such studies that had been submitted to the Washington level for review. Authorized and Construction projects were identified from testimony provided by the Chief of Engineers on 4 February 1987 to the House of Representatives Committee on Appropriations, Subcommittee on Energy and Water Development, at the Hearing for Energy and Water Development Appropriations for 1988. Following is the criteria used for identifying the survey population for each type of study and project, including the definition of "favorable" versus "unfavorable" for each.

RECONNAISSANCE STUDIES

The population of Reconnaissance studies includes all studies in the CECW-PM data base with a reported actual completion date in the period October 1, 1984 through March 31, 1988. Favorable studies were those resulting in recommenda-

tions to proceed to the Feasibility phase, while unfavorable studies resulted in recommendations to end the study process.

FEASIBILITY STUDIES

The population of Feasibility studies includes all studies in the CECW-PM data base with a reported Division Engineer Notice Date in the period October 1, 1984 through March 31, 1988. Again, favorable Feasibility studies were those resulting in recommendations to proceed to the next phase, in this case Authorization, while unfavorable studies resulted in recommendations to end the study process.

AUTHORIZED PROJECTS

Favorable Authorized projects are those projects listed in the Hearings testimony as "Preconstruction Engineering and Design (PED) in the FY 88 Budget" (both new start and continuing). These are the Authorized projects that were recommended to receive FY 88 funding for PED. Unfavorable Authorized projects are those projects listed as "Preconstruction Engineering and Design Not in the FY 88 Budget," except for those for which PED was previously completed. Since projects in this latter category were not really eligible for additional PED funding, they were considered as unfavorable projects in the subsequent Construction project category.

CONSTRUCTION PROJECTS

Favorable Construction projects are those projects selected as New Construction Starts in the FY 85 Supplemental, FY 87 and FY 88 budgets. The unfavorable Construction projects included the unfunded Authorized projects for which PED had been completed. It also included those Construction projects listed in the Hearings testimony as "Construction Projects Not in the FY 88 Budget" and for which less than 50 percent of their estimated construction cost had previously been allocated. Both continuing Construction projects and unfunded Construction projects that had previously been allocated over 50 percent of their estimated construction costs were not included in the survey population.

POPULATION

A preliminary population listing of 500 studies and projects (Table III-1, column 1) was identified from the CECW-PM data bases and Hearings testimony. This initial listing was reviewed by a point of contact in each COE Division office for duplications, errors in classification, and information on certain Reconnaissance studies as to whether they resulted in favorable or unfavorable report recommendations. As a result of this review, a final survey population of 489 studies and projects was identified (Table III-1, column 2).

TABLE III-1

Survey Population

<u>Study/Project Type</u>	<u>Preliminary List</u>	<u>Survey List</u>	<u>Analyzed</u>
Favorable Reconnaissance	18	41	41
Unfavorable Reconnaissance	17	29	22
Recommendation Unknown ¹	38	--	--
Favorable Feasibility	41	41	38
Unfavorable Feasibility	41	41	24
Funded Authorized	66	68	57
Unfunded Authorized	100	103	94
New Start Construction	86	86	74
Unfunded Construction ²	93	80	53
	<hr/>	<hr/>	<hr/>
	500	489	403

1. Whether or not the Reconnaissance study resulted in favorable or unfavorable recommendations was not included in the CECW-PM data base.

2. Includes Unfunded Authorized projects for which Preconstruction Engineering and Design was completed.

A survey questionnaire (described below) was sent to the appropriate COE District or Division office responsible for each of the 489 studies and projects identified in the survey population. Eighty-nine percent (436) of these were returned in time to be included in the analysis reported herein.¹ Based on field comments provided on the questionnaires, some minor changes in classifications were made and an additional 33 studies and projects were deleted from further consideration. This left a total of 403 studies and projects (Table III-1, column 3) from which the analysis and findings of this study are based (Chapters IV and V).

SURVEY QUESTIONNAIRE

The survey questionnaire (Appendix A) was designed to collect three types of information: general descriptive information about the preferred or recommended plan; demographics about the county(ies) in which the plan would be physically located and, for projects with 50 percent or more flood control benefits, the floodplain area; and other factors that influenced the selection and evaluation process.

General descriptive information included the percentage of benefits by project purpose, estimated construction costs, and a listing of the county(ies) in which the project would be located. With this latter information additional demographic variables could be compiled, other than those obtained directly from the field survey. This allowed not only additional analysis (described in the following chapter), but also additional verification of the consistency in the reported results.

The selection of the areal unit for collecting demographic data was partially dependent on being able to collect comparable data for all projects. For flood control projects, the floodplain residents are the primary direct beneficiaries, and demographic data were collected for these areas. For other outputs (e.g., navigation), the direct benefits often, either cannot be specifically identified, or are too dispersed, geographically, to make meaningful demographic comparisons. For comparisons between all studies and projects, including those providing, primarily flood control benefits, demographic data were collected for the county(ies) in which these studies or projects would be physically located. This areal unit allows for comparable data collection, and is often the area of primary concern when considering economic impacts and financial capability.

The requested county demographic data included: per capita income, median value of dwelling units, and percent of population residing in urban areas. For comparability, respondents were requested to use the 1983 County and City Data Book (US Department of Commerce, 1983) for reporting county demographic data. For

1 The remaining 53 questionnaires were subsequently received and reviewed. Summary analyses indicated that including the data from these additional 53 questionnaires would not change the results reported herein.

floodplain demographics, respondents were requested to provide similar information from the 1980 Census, based on Census Tracts or other Census subdivisions that would more closely approximate floodplain boundaries. During the editing of the survey questionnaires it was apparent that there was significant variation in the quality and precision of data reported at the floodplain level.

Questions on the selection and evaluation process addressed such issues as benefit/cost analysis; level of local support, participation, and financial capability; level of Congressional support; and environmental issues. It was requested that this portion of the questionnaire be completed either by the study or project manager, or a planner that had been extensively involved in the study process. The final question in this section requested the respondent to identify the one or two factors that were most significant in obtaining a favorable (or unfavorable) project recommendation or funding decision.

Four variations of the questionnaire were developed. The same information was collected by each. Minor variations in the wording of some questions were needed to account for: differences in terminology between the Reconnaissance and Feasibility studies and the Authorized and Construction projects, and the need to phrase the last question differently depending on whether or not the study or project had received a favorable, versus, unfavorable recommendation or funding decision.

CHAPTER IV

ANALYSIS

APPROACH

The primary objectives of the analysis are to determine if the COE selection and evaluation criteria are biased against rural areas or areas with greater proportions of low-income individuals and, if so, the causes for such biases. Comparisons of various demographic characteristics between studies and projects receiving favorable versus unfavorable study recommendations or funding decisions will be used to determine whether or not such biases exist. Various comparisons will be made including: by stage in the selection and evaluation process, by types of outputs being provided, and by the primary factors influencing the report or funding decision.

Three types of demographic characteristics will be used in the comparisons: various measures of income levels, a measure of housing value (i.e., the median value of owner-occupied dwelling units), and an indicator of the rural-urban nature of the area. For the latter, the percent of the population residing in urban areas is used when the comparisons are for the county(ies) in which studies or projects are located; for floodplain areas, the measure is the density of population, based on population and areal information provided on the survey questionnaires.

As noted in the previous chapter, the listing of county(ies) in which projects would be located allowed the development of additional demographic variables, besides those collected with the survey questionnaire. In all, three alternative measures of income were considered at the county level for this analysis: 1) aggregate per capita income, based on Bureau of Economic Analysis data, which serves as an indicator of the economic well-being of counties (US Department of Commerce, 1983); 2) per capita money income from the 1980 Census, which is comparable to the data collected for the floodplain areas of flood control projects;² and 3) median household income data from the 1980 Census, which provides a better indicator of income distribution than per capita income measures. During preliminary analyses, little difference was found when comparing results using the aggregate per capita and per capita money income measures. Because of the similarity of results and the comparability of the per capita money income measure between county and floodplain areas, results using the aggregate per capita income measure are not reported here.

2 County per capita personal income is also the measure used in the COE's Ability to Pay Provision for Flood Control Cost-sharing Requirements, developed in response to Section 103 (m) of P.L. 99-662.

Demographic data at the county level were compiled from the 1983 County and City Data Book (US Department of Commerce, 1983) to insure comparability between projects. When a project would be located in more than one county, the demographic measure was based on the population (county) weighted average. This process not only provided a comparable data base, but minimized the potential for measurement error. For flood control projects (described in more detail below), the demographics for floodplain areas were to be based on 1980 Census data. Although comparable data were used, floodplain and census boundaries often do not coincide, increasing the potential for measurement error. In reviewing the input data and comments provided, it was noted that often the floodplain demographics were either unreported, or based on rather rough correlations between floodplain and census areas. Thus, there is less reliability in the comparisons made using the floodplain data.

Before presenting the results it should be noted that the survey was a census of all studies and projects identified in the survey population, not a sample. Typical statistical tests and measures used in the analysis of sample data, such as confidence intervals, are, therefore, not presented. Median values are generally used in the reported comparisons as the indicator of the particular distributions central tendency.

One statistical test that was conducted was the extension of the median test. This test can be used to determine whether different groups (e.g., the groupings of favorable versus unfavorable studies and projects used in this study) are from the same, or independent populations. As described in Siegel (1956), the extension of the median test is a Chi-square analysis, based on the number of responses within each group that are greater than, and less than, the combined median value for all groups. A significance level of 10 percent was used in this study in the Chi-square analysis. Siegel (1956) or other statistical texts can be consulted for a more detailed explanation of the extension of the median test.

RESULTS

NATIONAL COMPARISON

Before beginning the comparisons of favorable versus unfavorable studies and projects, the survey data are compared with national statistics to provide some perspective of the areas in which COE water resources developments are being considered. In Table IV-I, median values from the survey questionnaires are compared with national data for Per Capita Income, Median Household Income, Median Value of Owner-occupied Dwelling Unit, and Percent Living in Urban Areas. The information is from the 1980 Census; both income categories are for money income received in 1979.

TABLE IV-1

COMPARISON OF ALL STUDIES AND PROJECTS WITH NATIONAL STATISTICS

(MEDIAN VALUE)

	<u>Per Capita Income</u>	<u>Median Household Income</u>	<u>Median Value Dwelling Unit</u>	<u>Percent Living in Urban Area</u>
Nation	7298	16,841	47,300	73.7
All Studies/Projects ¹	7013	16,221	41,300	71.5
Flood Control Projects ²				
Counties ¹	7134	16,857	42,250	75.3
Floodplain ³	7063	N/A	41,100	N/A

1. Demographics are for county(ies) in which projects would be located.

2. Flood control projects are those study projects with more than 50 percent flood control benefits or flood control designated as a primary benefit on survey questionnaire.

3. Demographics are for floodplain areas.

SOURCE: All county data are from the U.S. Department of Commerce, Bureau of the Census, County and City Data Book, 1983. Floodplain data are from appropriate 1980 Census State publications. Per Capita and Medium Household Incomes are for 1979; Median Value of Dwelling Unit and Percent Living in Urban Area are for 1980.

Median values are presented in Table IV-1 from the total 403 usable questionnaires as well as from the 195 questionnaires on which flood control was noted, either as the primary benefit, or as providing more than 50 percent of the total project benefit. These comparisons are based on all Reconnaissance and Survey studies and Authorized and Construction projects in the survey population, both those receiving favorable and unfavorable report recommendations or funding decisions.

Overall the median values for the COE studies and projects tend to be lower than the national statistics for all four variables. The exception is that for the counties in which flood control projects are being considered the Median Household Income (\$16,857 versus \$16,841) and Percent Living in Urban Areas (75.3 versus 73.7) are higher than the national values.

COMPARISON OF ALL STUDIES/PROJECTS

The comparisons in Table IV-1 are between the surveyed studies and projects and national statistics. The purpose of this study, however, is to compare the demographics of areas (counties and floodplains) in which COE studies and projects were receiving favorable report recommendations or funding decisions with those of the areas in which unfavorable recommendations or decisions were received. If a systematic bias against rural areas or areas with greater proportions of low-income individuals exists, three results would be expected.

- Overall, favorable studies and projects would tend to be located in areas with higher income levels and with greater percentages of individuals living in urban areas.
- At each stage of the selection and evaluation process, (i.e., Reconnaissance, Feasibility, Authorized and Construction), income levels and percentages of individuals living in urban areas should be higher for the studies and projects receiving favorable report recommendations or funding decisions than those receiving unfavorable ones.
- As studies and projects move through the process from the Reconnaissance to the Construction stage, the income levels and percentages of individuals living in urban areas would consistently increase. These measures should increase both for favorable and unfavorable studies and projects, as those located in poorer or more rural areas are screened by the selection and evaluation process.

The latter comparison can not be truly made, but only approximated with the survey data. That is, the true comparison would require following one "pool" of studies over time, to see which projects actually dropped out in moving from the Reconnaissance to the Construction stage. The survey projects in this study represent a "snapshot" in time, and the Reconnaissance studies in the survey are not the same group of Reconnaissance studies from which the study Construction Projects (and, similarly, the Feasibility and Authorized projects) were originally selected. The assumption

must be made that the demographics of the Reconnaissance studies in the survey are similar to those that were being considered when the study Construction projects were in the Reconnaissance stage for this latter test to be appropriate.

In Table IV-2, comparisons for all studies and projects receiving favorable versus unfavorable recommendations or funding decisions are presented for each of the four demographic variables. For these overall comparisons, the median, mean, minimum, and maximum values are presented as well as the range, standard deviation and number of cases.

For both income variables, the median and mean values are slightly higher for the favorable versus unfavorable studies and projects. However, these differences are very small, being less than one percent for the median and mean values of Per Capita Income and less than four percent for the median and mean values of Median Household Income, respectively (see Table IV-2). Both minimum and maximum values are less for the favorable than the unfavorable studies and projects, for both variables, while the ranges and standard deviations are comparable. Finally, the extension of the median test indicates that there is no statistical difference, (level of significance = .10), between the two groups for either of the income measures.

For the Median Value of Dwelling Unit, both the median and mean values are again larger for the favorable, than the unfavorable, studies and projects. The difference in median values is approximately 5 percent (\$42,300 versus \$40,800), and the difference in mean values is approximately 10 percent, (\$47,434 versus \$42,919). The extension of the median test, again however, indicates there is no statistical difference in the distribution of housing values between the two groups.

For the Percent Living in Urban Area variable, the difference was over 20 percent for both median (80.3 versus 62.0) and mean (72.3 versus 58.5) values, again with the highest values being reported for all favorable studies and projects. In this case, the extension of the median test does indicate a statistical difference and that the two groups are from independent populations.

TABLE IV-2

COMPARISONS OF ALL FAVORABLE AND UNFAVORABLE STUDIES AND PROJECTS

Variable	Cases	Median	Mean	Range	Minimum	Maximum	Standard Deviation
<u>Per Capita Income:</u>							
Favorable	210	7043	6944	8537	2066	10603	1,380
Unfavorable	191	6978	6894	8435	3203	11638	1,282
<u>Median Household Income:</u>							
Favorable	202	16330	16709	17251	7959	25210	1,015
Unfavorable	190	15943	16104	19187	8462	27649	1,051
<u>Median Value of Dwelling Unit:</u>							
Favorable	208	42300	47434	130600	10400	141000	6,215
Unfavorable	192	40800	42919	110700	18800	129500	5,213
<u>Percent Living In Urban Areas:</u>							
Favorable	209	80.3	72.3	100.0	0	100.0	25.4
Unfavorable	191	62.0	58.5	100.0	0	100.0	28.8

In Table IV-3, comparisons for all studies and projects receiving favorable versus unfavorable recommendations or funding decisions are presented by stage in the selection and evaluation process. The last line in Table IV-3, New Construction Start not Carried Forward to Construction, provides the demographics for nine surveyed projects that, although selected as a New Construction Project in the FY 85 Supplemental or FY 87 Appropriation Acts, were not recommended for receiving either preconstruction engineering and design (PED) or construction funds in the FY 88 Appropriations Hearings testimony. The demographic data for these projects are included in the previous New Start Construction category, since they were selected as New Construction Starts. However, because of their somewhat unique status, selected as New Starts but not recommended for funding, they will also be discussed separately where appropriate.

Income variables. When comparing within stages, the median response for Per Capita Income is higher for the favorable category at both the Reconnaissance (\$6,922 versus \$6,714) and Feasibility (\$7,249 versus \$7,050) stages, but lower at the Authorized (\$6,917 versus \$6,978) and Construction (\$7,036 versus \$7,163) stages. The median response for Median Household Income is higher for the favorable category at the first three stages, but lower at the Construction (\$16,013 versus \$16,670) stage. Thus, for five of the eight within stage comparisons, the income levels are higher for the favorable, versus the unfavorable, studies or projects.

The median response for the New Start not Carried Forward to Construction projects was higher for Per Capita Income, but lower for Median Household Income, than for the two other Construction categories (see Table IV-3). This indicates that, although the average wealth per person is higher, these projects would be located in areas with a greater proportion of lower income households.

In addition to the comparisons by stage, an objective of the analysis was to determine if the demographics of the study and project areas changed as they moved through the evaluation and selection process. That is, if a consistent selection bias existed, it would be expected that the income measures would be consistently higher as the studies and projects moved from the Reconnaissance to Construction stages. Again, however, it must be remembered that the comparison is not being made of the same "pool" of projects moving through the process, but a "snapshot" of those that were in the various stages when the survey was conducted.

Table IV-3

COMPARISONS OF ALL FAVORABLE AND UNFAVORABLE STUDIES AND PROJECTS BY STAGE

<u>Study/Project Type</u>	<u>Per Capita Income</u>	<u>Median Household Income</u>	<u>Median Value Dwelling Unit</u>	<u>Percent Living in Urban Area</u>
<u>Reconnaissance</u>				
Favorable	6922 (41)	16,302 (40)	43,306 (41)	75.8 (40)
Unfavorable	6714 (21)	15,969 (22)	34,320 (22)	70.4 (22)
<u>Feasibility</u>				
Favorable	7249 (38)	17,422 (37)	41,607 (38)	87.2 (38)
Unfavorable	7050 (24)	16,507 (24)	37,780 (24)	73.6 (24)
<u>Authorized</u>				
Funded	6917 (57)	16,602 (53)	41,018 (56)	78.4 (56)
Unfunded	6978 (93)	15,256 (92)	41,900 (93)	61.5 (92)
<u>Construction</u>				
New Start	7036 (74)	16,013 (72)	43,108 (74)	82.6 (74)
Unfunded	7163 (53)	16,670 (52)	40,532 (53)	56.7 (53)
New Starts Not Carried Forward To Construction	7168 (9)	15,571 (9)	43,850 (9)	73.8 (9)

For Median Household Income for favorable studies and projects, the median response is \$16,302 at the Reconnaissance stage, increases to \$17,422 at the Feasibility stage, but then declines to \$16,602 and \$16,013 at the Authorized and Construction stages, respectively. The median value at the last (Construction) stage is lower than for any of the previous stages, the opposite of what would be anticipated if a systematic bias existed. For unfavorable studies and projects the median response is highest (\$16,670) at the last (Construction) stage, but the value for the Authorized stage (\$15,256) is lower than for either the Reconnaissance or Feasibility stages (\$15,969 and \$16,507, respectively). Comparisons of the Per Capita Income measure produce similar results.

Median Value of Dwelling Unit. When comparing median responses for Median Value of Dwelling Units (Table IV-3) by stage a more consistent pattern emerges. Only at the Authorized stage is the median response for unfavorable projects (\$41,900) higher than the median response for favorable projects (\$41,018). For the other three stages, not only are the median responses higher for favorable than unfavorable projects, but the differences in median values tend to be much greater. Again, however, there is no systematic upward trend in values as the studies and projects move from the Reconnaissance to the Construction stages. Although the median value for New Start Construction Projects (\$43,108) is higher than the medians for favorable studies and projects at the Feasibility (\$41,607) and Authorized (\$41,018) stages, it is still slightly lower than the median value at the initial, Reconnaissance stage (\$43,306).

Percent Living in Urban Areas. The last demographic variable considered is Percent Living in Urban Areas, an indicator of the rural/urban mix of the study and project areas. This is the only variable for which a consistent bias by stage is indicated in the selection and evaluation process. At every stage the median Percent Living in Urban Areas is higher for those projects receiving a favorable report recommendation or funding decision than for those receiving an unfavorable one (see Table IV-3). Again, however, the median values do not consistently increase moving from the Reconnaissance to Construction stages. In this instance, the median values are highest for both favorable and unfavorable studies at the Feasibility stage, being 87.2 and 73.6 percent, respectively.

FLOOD CONTROL STUDIES/PROJECTS

Information, similar to that presented in Table IV-2 for all studies and projects, is presented in Table IV-4 for those for which flood control was noted either as the "primary" benefit, or providing more than 50 percent of the total project benefits, on the survey questionnaire. In addition to the demographics for the county(ies) in which the study or project is located, Per Capita Income and Median Value of Dwelling Unit data were also collected with the questionnaire for the floodplain areas for these studies and projects.

TABLE IV-4

COMPARISONS OF ALL FAVORABLE AND UNFAVORABLE FLOOD CONTROL STUDIES AND PROJECTS

Variable	<u>County Data</u>						Standard Deviation
	Cases	Median	Mean	Range	Minimum	Maximum	
<u>Per Capita Income:</u>							
Favorable	124	7084	7057	8537	2066	10603	1484
Unfavorable	70	7162	7024	5489	3924	9413	1298
<u>Median Household Income:</u>							
Favorable	121	16857	16922	17251	7959	25210	3304
Unfavorable	71	16928	16631	13142	9825	22967	3234
<u>Median Value of Dwelling Unit:</u>							
Favorable	124	44650	50510	119700	21300	141000	6989
Unfavorable	71	41100	42431	73400	19900	93300	4862
<u>Percent Living In Urban Areas:</u>							
Favorable	122	82.3	75.1	87.3	12.7	100.0	22.9
Unfavorable	71	63.6	60.7	97.7	0	97.7	29.6
<u>Floodplain Data</u>							
<u>Per Capita Income:</u>							
Favorable	112	7119	7050	10206	2719	12925	1725
Unfavorable	70	7022	7060	10776	3367	14413	1990
<u>Median Value of Dwelling Unit:</u>							
Favorable	114	43700	48795	127464	9436	136900	7169
Unfavorable	62	38050	40536	94500	14500	114000	5873

Overall the results are very similar to those presented for all studies and projects. Differences in median and mean values for the income variables are small (less than 2 percent) for both the county and floodplain data. For the county data, the median values of the income variables are slightly higher for the unfavorable, than the favorable, studies and projects, while the mean values are lower (see Table IV-4). For the floodplain data, the median value of the Per Capita Income variable is higher for the favorable studies and projects, but the mean value is lower. Differences in median and mean values are again larger for Median Value of Dwelling Unit (from 8 to 17 percent) and Percent Living in Urban Areas (19.5 to 29.4 percent), with the favorable studies and projects being higher than the unfavorable ones in all cases.

The extension of the median test indicates that differences in income measures between the flood control studies and projects receiving favorable, versus unfavorable, report recommendations or funding decisions are even less than observed previously for all projects. The differences are very definitely not statistically significant for both the county(ies) and the floodplain income measures. Differences in the distributions of the Value of Dwelling Unit are also not statistically significant. There is, however, a statistically significant difference in the distributions of Percent Living in Urban Areas measures between those flood control studies and projects receiving favorable, versus unfavorable, report recommendations or funding decisions.

Comparisons of favorable versus unfavorable flood control studies and projects, by stage of the selection and evaluation process are presented in Table IV-5.

Per Capita Income. When considering the immediate economic impact (county) area, the median response for Per Capita Income was higher for favorable, versus unfavorable, studies and projects at the Feasibility (\$7,584 versus \$7,526) and Construction (\$7,070 versus \$6,825) stages, but lower at both the Reconnaissance (\$6,990 versus \$7,965) and Authorized (\$7,043 versus \$7,110) stages. At the floodplain level (potential direct beneficiaries) the median response for Per Capita Income was higher for favorable studies and projects at all but the Authorized stage (\$6,841 versus \$7,000). At both the county and floodplain level, the median responses at the end of the selection and evaluation process (Construction stage) tend to be as low or lower than the responses for earlier stages.

It should also be noted in Table IV-5 that the median response for Per Capita Income for the floodplain areas is lower than for the county areas at every stage, except for favorable Reconnaissance studies. This would indicate the potential direct beneficiaries of these studies and projects tend to have lower incomes than those reported for the entire population of the counties in which the projects would be located.

Table IV-5

COMPARISONS OF ALL FAVORABLE AND UNFAVORABLE FLOOD CONTROL STUDIES AND PROJECTS BY STAGE
(MEDIAN RESPONSES)

Study/Project Type	Per Capita Income		Median Value Dwelling Unit		Household Income	Percent Living In Urban Areas
	County	Floodplain	County	Floodplain	County	County
Favorable Reconnaissance	6,990 (23)	7,203 (23)	45,100 (23)	45,065 (22)	16,236 (23)	77.1 (22)
Unfavorable Reconnaissance	7,965 (9)	7,028 (7)	36,904 (10)	33,600 (7)	18,259 (10)	74.1 (10)
Favorable Feasibility	7,584 (24)	7,324 (23)	46,100 (24)	40,711 (22)	17,962 (23)	89.2 (24)
Unfavorable Feasibility	7,526 (12)	7,199 (7)	42,400 (12)	47,800 (9)	18,091 (12)	73.5 (12)
Funded Authorized	7,043 (38)	6,841 (37)	41,750 (38)	41,700 (35)	16,602 (37)	80.2 (37)
Unfunded Authorized	7,110 (27)	7,000 (25)	42,300 (27)	35,475 (25)	15,599 (27)	62.8 (27)
New Start Construction	7,070 (39)	6,856 (38)	45,800 (39)	44,580 (35)	16,096 (38)	86.9 (39)
Unfunded Construction	6,828 (22)	6,690 (20)	40,716 (22)	38,100 (21)	17,198 (22)	56.3 (22)

Median Value of Dwelling Units. Overall, the median responses for Median Value of Dwelling Units, tend to be higher for the favorable versus unfavorable studies and projects. Only at the Authorized stage (\$42,300 versus \$41,750) at the county level and at the Feasibility stage (\$47,800 versus \$40,712) at the floodplain level is the median response for unfavorable studies and projects higher than for favorable ones. But again, there is no systematic trend towards higher valued dwelling units as studies and projects move through the selection and evaluation process. Median responses at the Construction stage are lower than one or more of the responses at earlier stages for both favorable and unfavorable projects for both county and floodplain areas. Also, as noted for Per Capita Income, the median responses for the value of dwelling units are lower for the floodplain areas than for their comparable county areas, with the only exception being for unfavorable Feasibility studies (see Table IV-5).

Median Household Income. For flood control studies and projects the median response is higher for the unfavorable projects at all but the Authorized stage (Table IV-5). In addition, the median response for New Start Construction projects (\$16,096) is lower than the median response for favorable studies and projects at all three previous stages. Similarly, although the median response for Unfunded Construction projects (\$17,198) is higher than the median response for Unfunded Authorized projects (\$15,999), it is still lower than the median responses for the Unfavorable Reconnaissance (\$18,259) and Unfavorable Feasibility (\$18,091) stages.

Percent Living in Urban Areas. Again, as for all studies and projects, favorable flood control studies and projects tend to be located in more urbanized areas. At every stage the median response for Percent Living in Urban Areas is higher for the favorable versus unfavorable studies and projects. However, as studies and projects move through the selection and evaluation process there is not a consistent trend towards projects being located in more urban areas. For favorable studies and projects, the highest median response (89.2 percent) occurs at the Feasibility stage. For unfavorable projects there is a consistent trend, that is the median Percent Living in Urban Areas is lower at each stage of the selection and evaluation process. This trend is opposite to what would be anticipated if there was a systematic selection bias against rural areas. That is if rural areas are systematically excluded at each stage, then the median response for both favorable and unfavorable studies and projects would be expected to consistently increase as the studies moved from the Reconnaissance to the Construction stage. This issue is discussed in more detail below.

For the flood control projects, the survey questionnaire requested information as to the size (in acres) and the estimated 1980 population of the floodplain area. These data were reported for 96 favorable and 45 unfavorable studies and projects and used to calculate floodplain densities. The median response for the favorable flood control studies and projects is 2.83 persons per acre, and 1.36 persons per acre for the unfavorable ones. Again, this supports the county information that favorable flood control studies and projects tend to be located in more urbanized areas. Be-

cause of the limited number of questionnaires for which both floodplain areal and population data are available, the information was not further disaggregated by stage in the selection and evaluation process.

COMPARISON BY TYPE OF STUDY/PROJECT OUTPUTS

Information from the first five tables indicates that flood control projects, both favorable and unfavorable, tend to be located in areas with higher incomes, higher values of dwelling units, and with greater percentages of persons residing in urban areas. The fact that both favorable and unfavorable flood control projects tend to be in these areas probably reflects the impact of urbanization on flood problems. That is, increased urbanization often results in increased runoff and other changes to the natural drainage system, which can exacerbate the potential for flooding and lead to the initiation of a flood control study. The higher housing values associated with these flood control studies and projects would also be expected, since housing values tend to be higher, other things being equal, in more urbanized areas.

Flood control is currently considered a mainline benefit category and emphasized in the budgetary process. Since previous analysis indicates flood control studies and projects tend to be located in more urbanized area and areas with higher income levels, a bias could be introduced through their preferred selection. In order to test for this selection bias, a comparison was made of the distribution of benefits provided by favorable, versus unfavorable, studies and projects.

The average percentage of flood control, navigation, and other benefits are presented in Table IV-6 for favorable versus unfavorable studies and projects for each stage of the selection and evaluation process. Program and budgetary guidance currently favors the selection of studies and projects providing these outputs. For all favorable studies and projects, almost 85 percent of the benefits, on average, are provided by these two benefit categories, ranging from 72.8 percent at the Reconnaissance stage to 85.9 at the Feasibility stage. Almost 60 percent of the benefits for favorable studies and projects are for flood control. However, for all unfavorable studies and projects, flood control and navigation provide only about 50 percent of the total benefits, ranging from 46.7 percent at the Authorized to 56.9 percent at the Reconnaissance stages.

TABLE IV-6

PERCENTAGE OF FLOOD CONTROL, NAVIGATION AND OTHER PROJECT BENEFITS

<u>Project/Study Type</u>	<u>Flood- Control</u>	<u>Navigation</u>	<u>Other</u>
All Favorable	59.7	23.7	16.6
All Unfavorable	38.1	12.0	49.9
Favorable Reconnaissance	56.3	16.5	27.2
Unfavorable Reconnaissance	47.1	9.8	43.1
Favorable Feasibility	58.8	27.1	14.1
Unfavorable Feasibility	47.0	4.5	48.4
Funded Authorized	60.1	21.2	18.7
Unfunded Authorized	32.9	14.3	53.3
New Start Construction	56.1	28.2	15.8
Unfunded Construction	43.1	10.3	46.5
New Starts Not Carried Forward To Construction	5.4	29.0	65.6

Also of interest in Table IV-6 are the results for the nine surveyed projects that were selected as New Start Construction Projects, but were not scheduled for PED or construction funding. For these nine projects, only about one-third of the benefits, on average, are from flood control and navigation outputs. Their distribution of benefits is much more similar to the other unfavorable studies and projects. Finally, based on additional background information, navigation and flood control benefits for New Start Construction Projects have increased from an average of 75 percent for FY 85 Supplemental New Starts, to 86 percent for FY 87, and to 100 percent for FY 88. These data indicate studies and projects with primarily flood control and navigation outputs are more likely to receive favorable report recommendations or funding decisions.

In Table IV-7 the demographics for the county(ies) in which the studies and projects would be located are summarized by primary output. That is, flood control (navigation) studies and projects are those for which flood control (navigation) was either indicated as the primary benefit or providing more than 50 percent of the total benefit on the survey questionnaire. Studies and projects not designated as either flood control or navigation are included in the "Other" category.

The median responses for flood control studies and projects are highest for Per Capita Income, Median Household Income, and Median Value of Dwelling Unit, followed by navigation and then the Other category (see Table IV-7). For Percent Living in Urban Areas, the median response for the navigation category (78.7 percent) is slightly higher than for flood control (75.3 percent), and both of these are substantially higher than the Other category (59.2 percent). The information in Table IV-7 confirms that studies and projects that do not provide, primarily, flood control or navigation benefits, tend to be located in more rural areas, areas with lower per capita incomes, and areas with greater proportions of low-income individuals, than those that do provide, primarily, flood control and navigation benefits.

These findings also help to explain the previous result, that the median value for Percent Living in Urban Areas was consistently lower moving from the Reconnaissance to the Construction stage. Many of the Authorized and Construction projects in this study were authorized before the current budgetary emphasis on flood control and navigation benefits was implemented. Thus, there are a larger number of projects in the "unfunded pool" of Authorized and Construction projects that probably would not have proceeded past the Reconnaissance or Feasibility stages under current priorities.

TABLE IV-7

SUMMARY OF DEMOGRAPHICS BY PRIMARY OUTPUT

	<u>Per Capita Income</u>	<u>Median Household Income</u>	<u>Median Value Dwelling Unit</u>	<u>Percent Living in Urban Area</u>
Flood Control	7,134	16,857	42,250	75.3
Navigation	6,944	16,462	41,300	78.7
Other	6,733	15,139	39,700	59.2

PRIMARY REASONS FOR FAVORABLE/FUNDED AND UNFAVORABLE/UNFUNDED DECISIONS

As described in Chapter III, one section of the survey questionnaire was used to obtain information concerning perceptions as to the importance of various selection and evaluation factors in the study process. The final question requested the study manager (or other respondent) to indicate the one or two factors that contributed most to the particular study or project receiving a favorable (or unfavorable) report recommendation or funding decision. The results from this question are summarized in Table IV-8.

Table IV-8 is divided into two parts. The upper (lower) half of the table summarizes the responses by stage for those studies and projects that received favorable (unfavorable) report recommendations or study decisions. For example, the 58.5 in the upper left corner of the table indicates, that for those Reconnaissance studies that resulted in a favorable decision to proceed to the Feasibility stage, 58.5 percent of the respondents indicated having a favorable Benefit Cost Ratio as one of the primary factors contributing to the favorable recommendation. Similarly the 40.9 under the Unfavorable Reconnaissance stage indicates that 40.9 percent of the respondents cited an unfavorable Benefit Cost Ratio as one of the primary factors contributing to the unfavorable recommendation. The sum of the percentages on any one line (i.e., stage in the selection and evaluation process) may exceed 100 since multiple responses were permitted.

Based on the survey questionnaires, the single most important decision factor at both the Reconnaissance and Feasibility stages is the Benefit Cost Ratio. This is true both for studies receiving favorable (58.5 and 50.0 percent at the Reconnaissance and Feasibility stages, respectively) as well as unfavorable (40.9 and 62.5 percent) report recommendations. The Benefit Cost Ratio remains an important factor at the Authorized and Construction stages (35.1 and 24.3 percent for favorable and 19.1 and 24.5 percent for unfavorable projects, respectively), but is less frequently cited than some of the other factors.

TABLE IV-8

PRIMARY REASONS FOR RECEIVING FAVORABLE
OR UNFAVORABLE DECISION (Percent)

<u>Study/Project Stage</u>	(Favorable)						
	<u>Benefit Cost Ratio</u>	<u>Federal Priority/ Interest</u>	<u>Local Support</u>	<u>Congressional Support</u>	<u>Local Sponsor Participation</u>	<u>Financial Capability</u>	<u>Other</u>
Reconnaissance	58.5	24.4	48.8	9.8	39.0	9.8	4.9
Feasibility	50.0	39.5	44.7	23.7	26.3	13.2	10.5
Authorized	35.1	31.6	47.4	45.6	26.3	3.5	7.0
Construction	24.3	31.1	44.6	33.8	18.9	13.5	10.8
	(Unfavorable)						
Reconnaissance	40.9	40.9	13.6	0	9.1	18.2	9.1
Feasibility	62.5	50.0	12.5	0	4.2	0	8.3
Authorized	19.1	41.5	18.1	11.7	12.8	6.4	19.1
Construction	24.5	34.0	15.1	3.8	17.0	11.3	34.0
New Starts Not Carried Forward to Constuction	11.1	44.4	11.1	0	0	11.1	22.2

For favorable studies and projects, the level of Local Support was noted as an important factor throughout the selection and evaluation process, ranging from 48.8 percent at the Reconnaissance to 44.6 percent at the Construction stages. Local Support is the interest and participation of local citizens, businesses, and public agencies in support and promotion of a study or project. Associated with local support is Local Sponsor Participation, which includes the necessary commitments by a non-federal sponsor to cost sharing requirements. For favorable studies and projects, Local Sponsor Participation was most frequently noted as being an important factor at the Reconnaissance stage (39.0 percent), and then declining in frequency to 26.3 percent at the Feasibility and Authorized stages and 18.9 percent at the Construction stage. One reason for the noted high frequency of Local Sponsor Participation in contributing to Favorable Reconnaissance recommendations could be the new requirement for local cost sharing of the Feasibility study.

Somewhat opposite to the findings for Local Sponsor Participation are the results for Congressional Support. That is, Congressional Support was noted more frequently as being a primary contributor to a favorable decision in the later, Authorized (45.6 percent) and Construction (33.8 percent) stages, than in the earlier, Reconnaissance and Feasibility stages (9.8 and 23.7 percent, respectively). Congressional support was the second most frequently cited factor for contributing to obtaining a favorable funding decision at the Authorized stage.

Being of Federal Priority/Interest was also frequently cited as being an important contributor to favorable decisions, ranging from a low of 24.4 percent at the Reconnaissance to a high of 31.6 percent at the Feasibility stage. Written comments indicated that respondents were most often noting that the project would provide, primarily, flood control or navigation benefits (i.e., being a Federal Priority) as the reason for their response.

When considering all stages in the selection and evaluation process, the most frequently cited factor contributing to unfavorable report recommendations or funding decisions was not a Federal Priority/Interest, ranging from 40.9 percent at the Reconnaissance to 50.0 at the Feasibility stage. Not a Federal Priority/Interest was also the most frequently cited reason (44.4 percent) for the nine New Starts not Carried Forward to Construction not receiving construction funding. Again, written comments indicated, that in 97 percent of the cases, the reason for not a Federal Priority/Interest was that the study or project would not be providing, primarily, flood control or navigation benefits.

Except for Benefit Cost Ratio and not a Federal Priority/Interest, the only other factor cited as contributing to an unfavorable report or decision on more than 20 percent of the questionnaires for any one stage was the Other category at the Construction stage (34.0 percent). Based on written comments, the Other reasons most frequently cited at the Construction stage include: environmental issues (4), unresolved local or plan formulation issue (3), authorization expired (3), and low priority project at Washington level (3).

SUMMARY OF DEMOGRAPHICS AND OUTPUTS BY REASONS FOR DECISIONS

In Table IV-9, demographic and project output data are summarized by the primary reasons studies and projects resulted in favorable or unfavorable report recommendations or funding decisions. Again, as with Table IV-8, the information is summarized separately for favorable (upper half of table) versus unfavorable (lower half) report recommendations or funding decisions. The data are not, however, disaggregated by stage of the selection and evaluation process. For comparative purposes, the first line of each portion of the table provides the comparable demographic and project output data for all favorable (upper half) and unfavorable (lower half) studies and projects.

Favorable Decisions. The most frequently cited reason for obtaining favorable report recommendations was Local Support, noted on 47 percent of the questionnaires. The distribution of benefits for these projects is very similar to those reported for all favorable studies and projects, but the projects would tend to be located in areas with higher income levels, values of dwelling units, and percentages of individuals residing in urban areas (see Table IV-9).

For almost 40 percent of the projects receiving favorable decisions, having a favorable Benefit Cost Ratio was considered one of the primary reasons that the favorable decision was obtained. Somewhat surprisingly, these projects tend to be located in areas with lower income levels, housing values, and percentages of individuals residing in urban areas than reported for all favorable studies and projects. This finding could, however, have resulted from analysts being more concerned with obtaining a favorable benefit cost ratio because of the somewhat poorer areas in which these projects would be located.

Unfavorable Decisions. Of special significance in Table IV-9 are the results for those studies and projects for which not a Federal Priority/Interest was a primary factor in their not receiving a favorable report recommendation or funding decision. This reason was noted for over 40 percent of the unfavorable studies and projects, and again, written comments indicate that the primary reason given for not being a Federal Priority/Interest was not providing, primarily, flood control or navigation benefits. The distribution of benefits for these projects is significantly different than for any other categorization. The average of 85.2 percent of "Other" benefits is more than one and one half times larger than the average for all unfavorable studies and projects (49.9 percent), and more than five times larger than the average for all favorable ones (16.6 percent). These studies and projects also tend to be in areas with lower income levels, values of dwelling units, and percentages of individuals living in urban areas (see Table IV-9).

TABLE IV-9

**SUMMARY OF DEMOGRAPHICS AND PERCENTAGE
OF BENEFITS BY REASON FOR FAVORABLE OR UNFAVORABLE DECISION**

(Favorable)

<u>Reason for Decision</u>	<u>Percent Indicating Reason</u>	<u>Per Capita Income</u>	<u>Household Income</u>	<u>% Urban</u>	<u>Dwelling Unit</u>	<u>FC</u>	<u>Navigation</u>	<u>Other</u>
All Favorable	-NA-	7043	16,330	80	42,300	59.7	23.7	16.6
Benefit Cost Ratio	39	6683	15,998	77	40,666	58.7	21.1	20.2
Federal Priority/Int.	31	7231	16,718	85	41,750	63.8	26.1	10.1
Local Support	47	7211	16,775	89	44,700	63.3	25.2	11.5
Congressional Support	31	7043	16,602	83	40,400	53.2	31.4	15.4
Local Sponsor Part.	27	6944	16,887	80	42,400	64.1	14.6	21.3
Financial Capability	10	7011	16,230	78	41,350	60.8	18.4	20.8
Other	9	6915	15,278	81	41,550	55.0	21.7	23.3

(Unfavorable)

All Unfavorable	-NA-	6978	15,943	62	40,800	38.1	12.0	49.9
Benefit Cost Ratio	28	6867	15,308	58	38,955	59.3	5.4	35.3
Federal Priority/Int.	41	6785	15,744	55	38,500	11.1	3.8	85.2
Local Support	16	7511	16,095	78	44,550	51.9	11.5	36.6
Congressional Support	7	5813	13,284	39	28,492	21.8	20.9	57.3
Local Sponsor Part.	12	6591	15,366	53	36,650	51.1	4.85	44.2
Financial Capability	9	7052	16,112	63	37,900	31.8	14.7	53.6
Other	20	7353	17,141	75	43,925	40.2	29.0	30.8

Similar to the findings for favorable studies and projects, the second most frequently cited reason for receiving an unfavorable decision is Benefit Cost Ratio. For 28 percent of the unfavorable studies and projects, having an unfavorable Benefit Cost Ratio was cited as a primary reason for the resulting unfavorable recommendation or funding decision. The studies with unfavorable benefit cost ratios do tend to be located in areas with lower income levels, value of dwelling units, and percentages of individuals living in urban areas (see Table IV-9). Although their distribution of benefits more closely approximates the distribution for favorable studies and projects, the average percentage of Other benefits is still more than twice as large (35.3 versus 16.6 percent).

Another interesting finding in Table IV-9 concerns those projects for which the Financial Capability of the sponsor was considered a primary reason for obtaining an unfavorable decision. Financial Capability was cited on less than 10 percent of the questionnaires, indicating it is not a very frequent problem area. More interestingly, the median responses for both Per Capita (\$7,052) and Median Household (\$16,112) Income are higher than those when considering all studies and projects receiving unfavorable recommendations or funding decisions (\$6,978 and \$15,943, respectively). In fact, the median response for Per Capita Income is even slightly higher than the comparable response (\$7,043) for all favorable studies and projects. This would indicate that the sponsor's Financial Capability is not a common problem, and when it does occur is not limited to lower income areas.

FLOOD CONTROL PROJECTS WITH UNFAVORABLE BENEFIT COST RATIOS

As noted in Chapter II, conceptually, COE efficiency evaluation criteria should be biased against flood control projects, both in rural areas, and in areas with greater percentages of low-income individuals. Although the previous analyses empirically substantiated a bias against rural areas, a similar, systematic bias against low-income areas was not found. One potential reason for this finding is that other factors within the selection and evaluation process are masking the effects of the efficiency criteria. To address this concern, the income variables for those flood control studies and projects with unfavorable benefit cost ratios were explicitly compared with the remainder of the flood control projects.

Reconnaissance Studies. There were only three flood control Reconnaissance studies with unfavorable benefit cost ratios. Per capita incomes for the floodplain areas were reported for two of these studies, and are \$4,889 and \$14,143. The median per capita income for floodplain areas for all Reconnaissance studies is \$7,028. The per capita incomes for the county(ies) in which the three studies with unfavorable benefit cost ratios would be located are \$4,530, \$8,259, and \$9,215. The comparable median value for all flood control Reconnaissance studies is \$7,523.

Feasibility Studies. There are eight flood control Feasibility studies with unfavorable benefit cost ratios, five of which had per capita incomes reported for the floodplain area. The per capita incomes for these five ranged from \$5,601 to \$7,800, with a median of \$6,829. The comparable median for all flood control Feasibility studies is \$7,259. The eight studies would be located in county(ies) with per capita incomes ranging from \$5,379 to \$8,229. The median value for the eight is \$7,336 as compare to \$7,568 for all flood control Feasibility studies. Based on the extension of the median test, there is no statistical difference in the per capita income distributions between the eight studies with unfavorable benefit cost ratios and the remainder of flood control projects at the Feasibility stage. This finding is true for both the floodplain areas, as well as the county(ies) in which these studies would be located.

Authorized Projects. Within the Authorized flood control category, nine projects reported unfavorable benefit cost ratios. Per capita incomes were reported for all nine for both the floodplain areas and the county(ies) in which the projects would be located. For the floodplain areas these per capita incomes ranged from \$3,367 to \$8,586, with a median of \$6,487. The median for floodplain area for all Authorized flood control projects is \$6,947. For the county(ies) in which the projects would be located, the range was from \$4,825 to \$9,413. The median is \$6,423 compared to the \$7,079 for all Authorized flood control projects. Again, based on the extension of the median test, there is no statistical difference in the distribution of per capita incomes between the two groups, both for the floodplain and the county(ies) measures.

Construction Projects. There were ten Construction stage flood control projects with unfavorable benefit cost ratios. Nine had per capita incomes reported for the floodplain areas. These ranged from \$3,681 to \$7,857, with a median value of \$5,207. The median per capita income for floodplain areas for all Construction projects is \$6,654. For the county(ies) in which these ten projects would be located, the per capita incomes range from \$4,623 to \$7,965. The median is \$6,816, compared to \$7,070 for all flood control projects at this stage. The extension of the median test indicates that there is a statistical difference in the distribution of floodplain per capita incomes between those projects with unfavorable benefit cost ratios and the remainder of flood control construction projects. Again, however, differences for the per capita incomes of the county(ies) in which the projects would be located were not statistically significant.

Only at the Construction stage, and then only for the floodplain areas, is a statistically significant difference observed in the distribution of per capita incomes between those studies and projects with unfavorable benefit cost ratios versus the remainder of flood control studies and projects. Once again, the potential conceptual bias of the COE efficiency criteria is not manifested in the actual studies and projects evolving from the selection and evaluation process.

INTEREST RATE

In his earlier review, Steinberg noted that the higher discount rates currently being used in benefit cost analysis ". . . makes justification of new projects for rural and poorer areas more difficult (Steinberg, 1984)." For 14 Authorized and Construction projects in the survey, it was noted that the projects had a favorable benefit cost ratio at their lower, authorized, but not at the current discount rate. These projects tended to be in poorer and more rural areas, with median responses of \$6,186 for Per Capita Income, \$13,682 for Median Household Income, \$28,482 for Median Value of Dwelling Units, and 40 percent Living in Urban areas. This small group of projects did tend to have both lower income levels and percentages of individuals residing in rural areas than for the overall survey population. There were still, however, other Authorized and Construction projects that had received favorable funding decisions with even lower minimum values for all of the demographic variables then reported for these projects.

CHAPTER V

SUMMARY AND CONCLUSIONS

SUMMARY

The primary objectives of this study were to identify factors that affect the selection and evaluation of COE projects and to determine if such selection and evaluation factors are biased against rural areas or areas with greater percentages of low-income individuals. The conclusions reported herein are based, primarily, on a survey of 489 COE studies and projects. The studies and projects are from various stages (i.e., Reconnaissance, Feasibility, Authorized, and Construction) of the COE selection and evaluation process (see Chapter III for a description of the survey population and questionnaire).

Comparisons of the demographics of studies and projects receiving favorable, versus unfavorable, report recommendations or funding decisions were made overall as well as at each stage of the selection and evaluation process. The comparisons were made for all surveyed projects, by various output categories, and for various factors that influence the selection and evaluation process. If a bias against rural areas or areas with greater proportions of low-income individuals exists, three results would be expected.

- Overall, favorable studies and projects would tend to be located in areas with higher income levels and with greater percentages of individuals living in urban areas.
- At each stage of the selection and evaluation process, income levels and percentages of individuals living in urban areas should be higher for the studies and projects receiving favorable report recommendations or funding decisions than those receiving unfavorable ones.
- The demographic measures for both favorable and unfavorable studies and projects should consistently increase as they move from the Reconnaissance to the Construction stage.

NATIONAL COMPARISON

The survey data from all projects, and from that subset of projects for which flood control was noted as a primary benefit, were first compared with national statistics to get some perspective of the areas in which COE water resource developments are being considered. Findings indicate COE projects are not limited to wealthier or more urban areas of the Nation, but are considered just as often, if not more often, in more rural areas and areas with lower income levels.

- When considering the entire survey population, the county(ies) in which the studies and projects would be located tend to have lower Per Capita Income, Median Household Income, Median Value of Dwelling Unit, and Percent Living in Urban Areas values, than those reported for the nation as a whole.
- Median responses for flood control studies and projects are higher than those reported for the entire survey population.
- When compared with the national statistics, median responses for flood control projects are slightly higher for Median Household Income and Percent Living in Urban Areas, but are still lower for Per Capita Income and Median Value of Dwelling Unit.

COMPARISON OF ALL STUDIES AND PROJECTS

When considering all studies and projects, there is no overall, systematic bias against areas with greater proportions of low-income individuals.

- When comparing all favorable versus all unfavorable studies and projects, there is very little (less than 2 percent) difference in median and mean responses for both Per Capita and Median Household Income measures.
- The extension of the median test indicates the difference in the distribution of income measures between those projects receiving favorable, versus unfavorable, report recommendations or funding decisions is not statistically significant.
- When comparing by stage of the selection and evaluation process, in only five of the eight comparisons are the median income measures for favorable studies and projects higher than those for the unfavorable ones.
- There is no consistent increase in median income values as studies and projects move from the Reconnaissance to the Construction stage.

Overall, studies and projects receiving favorable report recommendations or funding decisions do, however, tend to be located in more urbanized areas than the unfavorable ones.

- Median and mean values for Percent Living in Urban Areas are much (over 20 percent) higher for favorable studies and projects.
- The extension of the median test indicates there is a statistically significant difference in the distribution of values for Percent Living in Urban Areas between those studies and projects receiving favorable, versus unfavorable, study recommendations or funding decisions.
- At every stage, the median responses for Percent Living in Urban Areas, are higher for the favorable studies and projects than for the unfavorable ones.
- Again, however, the median responses do not consistently increase moving from the Reconnaissance to the Construction stage.

Median Values of Dwelling Unit do tend to be higher for the studies and projects receiving favorable report recommendations and funding decisions, but the differences are not statistically significant, based on the extension of the median test.

FLOOD CONTROL STUDIES/PROJECTS

Although the demographic values for flood control studies and projects tend to be higher, the comparisons are very similar to those reported for all studies and projects. There is no overall, systematic bias against low-income areas.

- There is very little (less than 2 percent) difference overall in mean and median values for Per Capita and Median Household Incomes between favorable and unfavorable studies and projects.
- The extension of the median test, very definitely, indicates the difference in the distributions of income variables between the favorable and unfavorable studies and projects is not significantly different, overall.
- In one half of the comparisons by stage the median income measures are higher for the unfavorable studies and projects.
- Median income measures do not consistently increase in moving from the Reconnaissance to the Construction stage.
- For all but the Favorable Reconnaissance study category, the median response for Per Capita Income is lower for the floodplain area than for the county(ies) in which the studies or projects would be located.
- Comparisons of income variables between flood control studies and projects with favorable, versus unfavorable, benefit cost ratios, further supports the finding that the COE's evaluation criteria does not result in a systematic bias against low-income areas.

Favorable flood control studies and projects tend to be located in more urban areas.

- For Percent Living in Urban Areas, both the mean and median values are more than 20 percent higher for the studies and projects receiving favorable report recommendations or funding decisions.
- The extension of the median test indicates a statistically significant difference in the distribution of Percent Living in Urban Area values, between the studies and projects with favorable, versus unfavorable, report recommendations or funding decisions.
- In the stage comparisons for Percent Living in Urban Areas, the median response for favorable studies and projects is always higher than for the unfavorable ones.

- There is not, however, a consistent increase in the Percent Living in Urban Areas measures, when moving from the Reconnaissance to the Construction stage.

Again, although the Median Value of Dwelling Units for the favorable studies and projects tend to be higher than for the unfavorable ones, the difference in their distributions is not statistically significant, based on the extension of the median test.

The above findings are based on comparisons of demographics for the floodplain areas, as well as for the county(ies) in which the studies and projects would be located.

The findings relative to income levels do not appear to be consistent with the opening (Chapter II) discussion of willingness to pay. That is, other things being equal, wealthier individuals would be expected to be able to pay more for flood protection projects and should be more highly represented in the favorable project categories. One possible explanation is that flood hazard areas, and especially those more frequently flooded, are more heavily populated by lower income individuals. Because of their lower income levels, these individuals are less mobile and less capable of evacuating the hazard area. Therefore, lower income groups are often located in the areas with the greatest potential for flood damage. This explanation is supported by the finding that the income levels of floodplain residents tend to be lower than those of the entire county(ies) population in which the floodplain is located.

PRIMARY REASONS FOR FAVORABLE/FUNDED AND UNFAVORABLE/UNFUNDED DECISIONS

As part of the survey questionnaire, field planners and study managers were asked to indicate the one or two primary reasons a particular study or project received a favorable, or unfavorable, report recommendation or funding decision. The following findings are based on the respondents' reported perceptions as to the primary contributing factors to these decisions.

Favorable/funded studies and projects. Overall, the most frequently cited factor for studies and projects receiving favorable report recommendations or funding decisions was the level of Local Support. It was cited on almost one half of the favorable study and project questionnaires at every stage of the selection and evaluation process.

The next most frequently cited factor for favorable studies and projects was the Benefit Cost Ratio. It was cited on almost forty percent of the questionnaires, overall, and was the most frequently cited factor at both the Reconnaissance and Feasibility stages.

Other important factors in obtaining favorable report recommendations are a Federal Priority/Interest and level of Congressional Support. Being a Federal Priority/Interest (primarily providing mainline benefits), was cited on almost one quarter or more of the questionnaires at each stage. The level of Congressional Support becomes especially important at the Authorized and Construction stages, being cited on more than a third of the questionnaires at each of these stages.

Unfavorable/unfunded studies and projects. Overall, the most frequently cited reason for obtaining an unfavorable decision was not a Federal Priority/Interest (primarily not providing mainline benefits). It was cited on more than one third of the questionnaires at each stage of the selection and evaluation process and on over 40 percent, overall.

The Benefit Cost Ratio was the next most frequently cited factor for unfavorable decisions. It was cited on about 30 percent of the questionnaires, overall, and, as with favorable studies and projects, was the most frequently cited factor at the Reconnaissance and Feasibility stages.

For the unfavorable studies and projects, not a Federal Priority/Interest and Benefit Cost Ratio are the only two factors cited on more than 20 percent of the questionnaires.

PROGRAM AND BUDGET PRIORITIES

As noted above, program and budget priorities (as reflected in responses to the Federal Priority/Interest factor) was one of the most frequently cited reasons for studies and projects receiving both favorable and unfavorable report recommendations or funding decisions. Although initial comparisons did not identify any overall, systematic bias in the COE selection and evaluation process against low-income areas, they did indicate that flood control (a mainline output) studies and projects tend to be located in more urban and wealthier areas and represent a much higher proportion of the studies and projects receiving favorable report recommendations or funding decisions.

In recent budgets, the primary emphasis has been on the two mainline benefit categories of flood damage control and commercial navigation. Further analyses of the survey data indicate:

- For all favorable studies and projects, almost 85 percent of the benefits, on average, are for flood control and commercial navigation, versus approximately 50 percent for unfavorable ones.
- Studies and projects providing primarily flood control and navigation benefits are located in more urban areas and areas with higher income levels and housing values than those providing other types of benefits. These differences are statistically significant.

CONCLUSIONS

The conceptual review identified a potential bias against both rural areas and areas with greater percentages of low-income individuals in COE evaluation guidance. Comparisons of demographic data from a survey of COE studies and projects receiving favorable, versus unfavorable, report recommendations and funding decisions indicate that an overall, systematic bias against rural areas does exist. However, the analysis does not support the conclusion that the evaluation guidelines result in a similar selection bias against low-income areas. Changing or eliminating COE efficiency criteria would not significantly change the percentage of studies or projects receiving favorable report recommendations or funding decisions in areas with greater percentages of low-income individuals.

Based on the perceptions of field planners and study managers, the single most important factor contributing to studies and projects receiving unfavorable report recommendations or funding decisions is not being a Federal Priority/Interest. That is, primarily, not providing mainline benefits. Further analysis indicates that studies and projects providing primarily flood control or navigation benefits tend to be located in more urban areas and areas with higher income levels than studies and projects providing primarily other types of benefits. The conclusion is that present program and budgetary priorities are a very important factor in the selection process, and they are systematically biased against the types of projects that tend to be located in rural areas and areas with greater percentages of low-income individuals. Changes in program or budgetary priorities could increase the percentage of studies and projects receiving favorable report recommendations or funding decisions both in rural areas and in areas with greater percentages of low-income individuals.

REFERENCES

Allee, David J., and Helen M. Ingram 1972. Authorization and Appropriation Processes for Water Resource Development, prepared for National Water Commission, Cornell University: Ithaca, New York.

Conservation Foundation, 1984. America's Water: Current Trends and Emerging Issues, Washington, D.C.

Directorate of Civil Works, 1988. Report of the Corps of Engineers' Panel on Project Development in Partnership, U.S. Army Corps of Engineers, Headquarters: Washington, D.C.

Haveman, Robert H. 1965. Water Resource Investment and the Public Interest, Vanderbilt University Press: Nashville, Tennessee.

Holmes, Beatrice H., 1972. A History of Federal Water Resources Programs, 1800-1960, US Department of Agriculture, Miscellaneous Publication no. 1233: Washington, D.C.

Interstate Conference on Water Problems/U.S. Army Corps of Engineers, 1985. Digest of Proceedings: Workshops on Water Project Financing, U.S. Army Corps of Engineers, Institute for Water Resources, Policy Study 85-PS-2: Ft. Belvoir, Virginia.

Sickles, Mark D., 1986. The Future of Intergovernmental Relations and the U.S. Army Corps of Engineers: Changing Traditions and Building New Partnerships, U.S. Army Corps of Engineers, Institute for Water Resources, Working Paper 86-WP-1: Ft. Belvoir, Virginia.

Siegel, Sidney, 1956. Nonparametric Statistics for the Behavioral Sciences, McGraw-Hill Book Company: New York, New York.

Steinberg, Bory, 1984. Flood Damage Prevention Services of the U.S. Army Corps of Engineers: An Evaluation of Policy Changes and Program Outcomes During 1970-1983 Measured Against Criteria of Equity, Efficiency, and Responsiveness, U.S. Army Corps of Engineers, Institute for Water Resources, Dissertation 84-D-2: Ft. Belvoir, Virginia.

U.S. Army Corps of Engineers, 1987. "Six Steps to a Civil Works Project," Engineer Pamphlet EP 1105-2-10: Washington, D.C.

U.S. Department of Commerce, Bureau of the Census, 1983. County and City Data Book, 1983, U.S. Government Printing Office: Washington, D.C.

U.S. Water Resources Council, 1983. Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, U.S. Government Printing Office: Washington, D.C.

Whitten, James, 1986. "50th Anniversary of the Flood Control Act of 1936," Congressional Record - House, June 25, 1986: Washington D.C.

APPENDIX A

SURVEY QUESTIONNAIRE

Following is a copy of the General Survey Instructions and the survey Questionnaire. As was noted in Chapter III, there were four versions of the Questionnaire. The same information was collected with each. Minor variations in the wording of some questions were needed to account for: differences in terminology between the Reconnaissance and Feasibility studies and the Authorized and Construction Projects, and the need to phrase the last question differently, depending on whether or not the study or project had received a favorable, versus an unfavorable or funding decision.

GENERAL INSTRUCTIONS FOR SECTION 719 STUDY QUESTIONNAIRE

Information from the attached questionnaire will be used in a review of the Corps evaluation and selection criteria for water resources development projects. The study was requested by Congress in Section 719 of the Water Resources Development Act of 1986 (P.L.99-662).

There are three sections to the questionnaire. The first section identifies the project or study for which survey data are requested and provides some descriptive information as to the type of study and its status. For reconnaissance and feasibility studies, this information was obtained from CECW-PM data bases used for tracking these studies at the Washington level. For authorized and construction projects, the information was obtained from Corps testimony given at the FY 88 Congressional Appropriations Hearings. It is possible for a particular project to have more than one study questionnaire if it has gone through more than one planning stage (e.g., feasibility and authorization) since FY 85. If so, all questionnaires should be completed, even if the responses to all questions are the same, since we want to know whether or not factors that affect project evaluation and selection change as projects move through the various stages of planning.

The second section requests information on project benefits and costs and on demographics of the study area. For authorized and construction projects this information should be for the recommended project. For reconnaissance and feasibility studies (if a particular project is not recommended) it should be for the most likely or preferred alternative, **other than the no action alternative**. If a reconnaissance or feasibility report resulted in a recommendation not to proceed forward to the next stage of planning, the information should be provided for the most preferred of the alternatives considered, even though it did not result in a positive recommendation.

The final section requests information or perceptions about factors affecting plan selection and evaluation. This information is critical to the successful completion of this study. The section should be completed, either by the study manager, or a planner familiar with the study process for that particular project. All responses will be kept confidential, and respondents are encouraged to expand and clarify responses to specific questions.

Any questions concerning the questionnaire or study can be directed to your division point of contact for the 719 Study or to Bill Hansen at the Institute for Water Resources, (202) 355-3089.

Section 719 Study of Corps
Project Evaluation and Selection Criteria

DATA COLLECTION FORM 1A

RECONNAISSANCE & FEASIBILITY REPORTS

Section I

1. Study Name:			
2. Study Type:		THIS PORTION WAS PRECODED ON QUESTIONNAIRE	
3. District:			
4. Status Code:			

Section II

1. For the recommended project or most preferred alternative, indicate the approximate percentage of benefits that come from the project purposes listed below. If project benefits were not computed, place a "P" beside the primary purpose, and an "S" beside any major secondary purposes of the project.

<u>Project Purpose</u>	<u>Percent Project Benefits</u>
Flood Control	_____
Navigation	_____
M&I Water	_____
Hydropower	_____
Beach Erosion	_____
Recreation	_____
Fish & Wildlife	_____
Area Redevelopment	_____
Other _____	_____
Other _____	_____
	100

2. Total estimated construction cost of recommended project or most preferred alternative in October 1987 price levels: _____

3. Names of county(ies) and state(s) in which project would be physically located:

<u>County(ies)</u>	<u>State</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

4. For the locale identified in question II-3 provide an aggregated total for the variables requested below. These data are available in Table B in the Bureau of Census 1983 County and City Data Book. The Table B column numbers in which these data are available are identified in brackets for each variable.

a. Total 1980 population (sum of population for all counties comprising the locale); [use column 2].

Total Population: _____

b. Weighted average median per capita income for 1981 (~~median~~ per capita personal income for each county comprising the locale weighted by the share of population that the county contributes to the locale); [use column 2 for population for weighting, column 117 for income], see example below:

Example: County <u>population</u>	Share of contribution of county to locale <u>population</u>		County per capita <u>personal income</u>	
60,000	.60	*	\$ 8,500	\$5,100
<u>40,000</u>	<u>.40</u>	*	11,500	<u>\$4,600</u>
100,000	1.00			Weighted Ave = \$9,700

Total Weighted Average
~~Median~~ Per Capita Personal Income: _____

c. Weighted average of percentage of population living in urban areas in 1980 (percent of county population living in urban areas weighted by the share of population that the county contributes to the locale - use the same county shares as used in 4b.); [use column 6 for per capita income], see example below:

Example:	Share of contribution of county to locale <u>population</u>		Percent of the county <u>population urban</u>	
	.60	*	35.0	21.0
	<u>.40</u>	*	10.2	<u>4.1</u>
	1.00			Weighted Ave = 25.1

Total Weighted Average
Percent of Population Living in Urban Areas: _____

d. Weighted average median value of owner occupied dwelling units in 1980 (median value of owner occupied dwelling unit for each county comprising the locale weighted by the share of owner occupied dwelling units that the county contributes to the locale); [use columns 78 and 84 to determine number of owner occupied units by county for weighting, column 86 for median value], see example below:

Example:	<u>Housing units</u>				
	<u>% owner</u>	<u># owner</u>	<u>County share</u>	<u>Median</u>	
<u>Total</u>	<u>occupied</u>	<u>occupied</u>	<u>of locale</u>	<u>value</u>	
1,600	* 75.0/100	1,200	.25	* \$72,000	\$18,000
4,500	* 80.0/100	<u>3,600</u>	<u>.75</u>	* \$48,500	<u>\$36,375</u>
		4,800	1.00		Weighted Ave = \$54,375

Total Weighted Average
Median Value Owner Occupied Dwelling Units: _____

5. NOTE: Only answer this question if the percentage of project benefits for flood control indicated in question II-1 was $\geq 50\%$, OR if you placed a "P" beside flood control. If neither of these conditions apply, go on to Part III on page 5.

a. What is the area in acres that would receive flood protection from the recommended plan or most preferred alternative?

_____ acres

b. What level of protection (e.g., 25-year) will be provided by the recommended plan or most preferred alternative? (Note: if the level of protection varies within the project area, indicate the maximum and minimum levels that will be provided.)

Level of protection _____

Answer the following for the area identified in 5a. Estimates should be based on data from the 1980 Census, and can be produced using census tracts or other enumeration areas to approximate the benefit area.

c. Approximate total 1980 population: _____

d. Weighted average median 1979 per capita personal income. Note: use same procedure as that described in II-4b to compute weighted average; substitute census tracts or other enumeration areas for counties. Use the 1980 census for the per capita income data. Do not use the per capita income data from the 1983 County and City Data Book here, since that is for 1981 rather than 1979.

Weighted Average ~~Median~~ 1979 Per Capita Personal Income: _____

e. Weighted average 1980 median value of owner occupied dwelling units. Note: use same procedure as that described in II-4d to compute weighted average; substitute census tracts or other enumeration areas for counties.

Weighted Average Median Value of
Owner Occupied Dwelling Units: _____

Section III

Please check the appropriate box in response to the questions below, but more importantly use the space provided to clarify and expand your answers. Should you need more space, continue on another sheet of paper and attach it to this questionnaire. When you answer the questions in this Section orient your answers to the period of time when the reconnaissance or feasibility report was prepared.

1. Benefits were in excess of costs for the recommended project or preferred alternative.

- Yes
- No

Any remarks about benefit/cost analysis: _____

2. Did the project meet the administration's Federal Interest criteria?

- Yes
- No

If no, why not? _____

3. Level of local support for the project.

- High
- Low

What groups supported the project: _____

What groups opposed the project: _____

4. Level of congressional support for the project.

- High
- Low

Please explain your assessment. _____

5. A local sponsor was identified.

- Yes*
- No**

* Identify the local sponsor in terms of organizational type (e.g. state, local board, etc.)

** If no, why not

6. Financial capability of the local sponsor to perform.

- Acceptable
- Unacceptable

Comments: _____

7. Local sponsor was willing to participate and sign FCSA and/or LCA.

- Yes
- No

Comments: _____

8. Environmental problems associated with recommended project.

- Significant*
- Not significant

* Describe the major environmental issues: _____

9. According to the CECW-PM data bases used for tracking these reports, this report resulted in a recommendation to proceed forward to the next stage of planning (recon to feasibility, feasibility to PED). From the factors below select the ONE OR TWO factors that were most responsible for obtaining a report that recommended proceeding forward to the next planning phase. (Check the one or two most appropriate boxes below)

<u>Factors</u>	<u>Most Important</u>
B/C ratio	<input type="checkbox"/>
Met Fed'l Interest Criteria	<input type="checkbox"/>
Level of Local Support	<input type="checkbox"/>
Level of Congressional Support	<input type="checkbox"/>
Local Sponsor Participation	<input type="checkbox"/>
Financial Capability of Local Sponsor	<input type="checkbox"/>
Other _____	<input type="checkbox"/>
Other _____	<input type="checkbox"/>

Please briefly explain your answer. _____

Thank you for your help!