

1. Purpose and Scope

These principles and the associated guidelines are intended to ensure proper, consistent and transparent planning in the formulation, evaluation, and selection of proposed Federal water and related land resources projects.

These principles establish the process for such planning studies and how each phase of the process functions. In addition, these principles provide the analytical framework to be followed for proposed further investments in, extensive modifications to, and expanded changes in operation of existing Federal water resources projects and systems.

2. National Planning Objective

The national objective of water and related land resources planning is to foster environmentally sound, efficient use of the Nation's resources consistent with public safety. This can be accomplished through watershed analyses that recognize the interdependency of water uses. This is strengthened by capitalizing on a collaborative planning and implementation process which incorporates fully informed participation from Federal agencies, non-Federal interests, non-governmental organizations, State and local and Tribal governments, and a full range of water users and stakeholders.

Water and related land resources planning that is consistent with the national planning objective seeks to incorporate some or all of these elements: facilitate sustainable national economic development, encourage wise use of water and related land resources - including floodplains and flood-prone coastal areas, support the protection and restoration of significant aquatic ecosystems, promote the integration and improvement of how the Nation's water resources are managed; and reduce vulnerabilities and losses due to natural disasters.

3. Overview

The basic planning process consists of the following major steps:

(1) Specification of the water and water related land resources problems and opportunities in the planning setting and their relationship to the national planning objective;

(2) Inventory and analysis of the current condition of the water and related land resources relevant to the identified problems and opportunities;

(3) Identification of study objectives with respect to the problems and opportunities, after taking into account current and potential future uses of the water resources;

(4) Formulation of a full range of alternative plans reflecting those study objectives;

(5) Evaluation of the potential effects of the alternative plans;

(6) Comparison of the alternative plans; and

(7) Selection of a proposed plan, which best meets both the study objectives and the national planning objective.

The planning process is dynamic with various steps that should be iterated as new data are obtained, or as the understanding of the problems, opportunities, and study objectives or their significance changes or is better defined. These iterations, which may occur at any step, may sharpen the planning focus or change its direction or emphasis.

4. Watersheds

Water and related land resources have many, and at times competing, alternative uses. Water resources planning can identify and address the synergies and trade-offs associated with these multiple uses within the watershed.

Water and related land resources planning should commence from the watershed level to determine how the problems and opportunities being examined in a study fits into the current and expected watershed needs. The planning effort is primarily informed by such watershed analysis wherein proposed projects are considered in the full light of upstream and downstream conditions and needs that ensures project recommendations are part of a complementary systems solution. This highlights the importance that planning proceed, in a coordinated systems context, with the interactions of other programs, projects, and plans that are relevant within the related watershed being understood.

Water resources planning is collaborative and may consider alternatives and strategies for implementation by other Federal agencies, state and local agencies, Native American tribes, non-Federal interests, non-governmental organizations, affected groups and individuals, and/or the public at large. The focus should be on developing plans that are consistent with the national planning objective and are efficient, complete, and effective.

5. Science Based Analysis

Harnessing accurate and high quality data, using expert knowledge, and taking an interdisciplinary approach to incorporating the information into the planning process is critical to effective and well executed planning.

KNOWLEDGE

Water and related land resources planning can only be successful when using knowledge and expertise effectively, as well as, the best information available in each step of the process. Objectivity and the elimination of sources of potential bias are critical in the planning process.

ACCURACY AND QUALITY OF DATA

Decision-making can be of the highest quality when it is founded on the best available data and models with high degrees of accuracy in hydrology, engineering, geology, ecology, other physical and life sciences, economics and other relevant social sciences.

INTERDISCIPLINARY PLANNING

Due to the complicated nature of water and related land resources planning, an interdisciplinary team approach to planning will ensure the proper integration of engineering, physical and life sciences, social sciences, economics, and environmental design. Success in planning is best achieved by matching appropriate planning disciplines to the planning issues to be addressed.

PEER REVIEW

Peer review by experts from within the agency is an important element of successful planning. It can add to the knowledge available to planners and is best integrated into the planning process on an ongoing basis. Where appropriate, outside independent experts should be brought into the planning process to confirm the agency's analytical methods and analysis, the conclusions of the report based on these methods and analysis, or the way in which the agency conducted the planning process.

RISK AND UNCERTAINTY

Water and related land resources planning, even with the best engineering, science, economics and other knowledge possible, will still have elements of risk (probability of occurrence) and uncertainty (imprecision of measurements and analysis). It is important to explicitly identify, characterize, and document the risks and uncertainty throughout the planning process. A clear description of the risks and uncertainties adds important value to the planning process by allowing decisions to be made with full knowledge of the degree of reliability and the limits of the data and information used.

6. Conditions

Gathering information on the conditions in an area that is relevant to the planning issues under study is essential before defining a series of alternatives. Though conditions may change or become better defined during the planning process, it is essential to understand the conditions that are important to the planning issue and developing the assumptions based on those conditions in a logical, clear and transparent manner.

INCLUSION OF OTHER PARTIES

Other interested Federal agencies, state and local agencies, affected groups and individuals, Native American tribes with an interest, and the public at large are to be provided a full opportunity to inform decisions throughout the planning process, including providing data and evidence necessary for plan formulation and evaluation.

INVENTORY OF CURRENT CONDITIONS

An inventory of current water and related land resources conditions in the area of the watershed that either is contributory to or affected by the planning effort is an integral part of being able to describe the existing conditions. An inventory, sufficiently broad in scale to encompass all significant causes and effects is integral to the planning process. Significant physical, economic, ecological, safety, cultural, social, aesthetic, and other relevant conditions that are part of this inventory provide a snapshot of the present, and are a consequence of the past. Therefore, the inventory is likely to include the relevant geologic, geomorphologic, hydrologic, climatic, economic, cultural, social, land use, and other historic data necessary to build the picture of the present.

An inventory, which is expanded as needed to assist the planning process, can be used throughout the process to advance the national planning objective - for example, to revise the statement of problems and opportunities or further define them; to identify or revise the study objectives; to sharpen the planning focus or change its direction or emphasis; and to inform the formulation and refinement of alternative plans and the evaluation of those plans.

PROJECTION OF WITH AND WITHOUT PLAN CONDITIONS

The world is dynamic and planning for the uncertain future requires a reasonable forecast of future events and outcomes. The inventory and analysis of current conditions provides the baseline data for use in forecasting future conditions.

A specific set of assumed future conditions, based on the best estimate of the conditions that are likely to prevail in the presence and in the absence of a proposed action, is one approach to look at future conditions. The with and without plan condition is an objectively based, extrapolation of current conditions into the future which serves as one basis for estimating and evaluating the cost, effectiveness, and beneficial and adverse effects of the alternative plans.

The development of the with and without plan condition is guided primarily by what is known and is the key part of the planning process that drives justification of recommended projects. Assumed changes from the present to the future are based on a series of observed past events that provide a reasonable basis to quantify the probability of occurrence of a similar trend into the future.

The future conditions also reflect any such changes that are likely to occur under current government policy. As these are the basis for future analyses, it is important that the rationale for development of these conditions be clearly documented.

7. Plan Formulation

Plan formulation is undertaken to determine the Federal interest in solving identified water resources problems. This is accomplished by creating a full range of alternative plans meeting the national planning objective while reflecting the study objectives for water and related land resources projects. While development of alternatives is

generally unconstrained, the development of alternatives must take into account the ability to implement that plan in consideration of Federal and non-Federal resources considering their availability for water resources purposes nationwide is finite - both at any point in time and over the long-term.

7.1 General Considerations

Structural Plans

Structural plans are those that intentionally modify existing hydrologic and geomorphic processes, including most aquatic ecosystem restoration plans.

Non-Structural Plans

Non-structural plans are those that avoid or minimize changes to the existing hydrologic and geomorphic processes by changed management or use of existing infrastructure or by emphasizing alternatives that manage human activity and development.

Nonstructural alternatives also often avoid or minimize adverse impacts in the aquatic environment.

Public Safety

Addressing concerns over public safety is achieved by assuring infrastructure is reliable, and that risks posed to human life and security are avoided, reduced, or mitigated consistent with current engineering standards and are a component of both structural and nonstructural plans. Additionally, plans that clearly describe any residual risk, the measures to address or manage that risk, its resiliency, and the associated components of cooperation needed to assure public safety stand to add value and understanding to the planning process.

Environmental

Addressing concerns over adverse environmental impact and how to avoid, minimize, and mitigate these impacts on the environment are a component of both structural and nonstructural plans.

Key Assumptions

Important to the planning process is understanding and explicitly stating the key assumptions, the supporting rationale for these assumptions, and the predicted and achieved outcomes based on similar approaches used in the past that have relied heavily on these assumptions.

Lifecycle Considerations

An ongoing evaluation of the lifecycle and ability of current systems to meet contemporary needs is especially valuable during the planning process. The planning process provides an opportunity to evaluate and examine whether extensively modifying operations, adding features, or discontinuing features would contribute to the national planning objective.

Wide Range of Plans

A range of alternative plans, significantly differentiated from each other in terms of their composition of measures, the extent to which they comport with the national planning objective, and their scale and features, are necessary to have the greatest chance of identifying the best plan for addressing the planning issues.

Integration with Other Plans

Alternative plans that are consistent with other established Federal, State, local and Tribal plans can add value to the alternatives. This includes any synergy with other entities watershed plans, aquatic ecosystem plans, and integrated water resource management plans or any elements contained within them. The inclusion of clear and explicit descriptions and consideration of these other entities' plans as well as describing the similarities and differences, synergies and discrepancies, potential implementation coordination, and other relevant explanations of their plans adds clarity to the planning process.

Consistency with Existing Statutes, Regulations & Policies

Addressing concerns over the implementability of plans is best addressed by including plans that are consistent with existing statutes, regulations and policies along with describing explicitly how they influence the planning process. Statutory, regulatory, and/or policy changes necessary to facilitate a plan should be described in detail.

7.2 ALTERNATIVE PLANS

Plans are formulated from combinations of structural and nonstructural measures that address the planning problems and opportunities.

REQUIRED ALTERNATIVES

In order to facilitate the development of the widest range of practical alternative plans, the following required alternatives constitute the minimum series of plans necessary. The concept of a practical alternative plan means that any of the required alternatives below can and often will include elements that meet the other objectives.

National Economic Development (NED) Plan: A plan that primarily maximizes the net contributions to the NED objective as part of the national planning objective.

Environmental Quality (EQ) Plan: A plan that primarily maximizes the net quantity or quality of the environmental quality objective as part of the national planning objective.

Primarily Nonstructural Plan: A plan which primarily employs nonstructural elements, and as a secondary consideration adds structural features to address the planning issues.

8. Evaluation of Plans

All plans should be well characterized, explained, and justified. The thorough evaluation of the range of plans developed requires an open assessment of the plans ability to meet the evaluative criteria that begins with, but is not limited to, the national planning objective. Additionally, evaluating the effects of each alternative plan includes, but is not limited to, its impacts on current and potential future uses of the water resources and related land uses throughout the watershed, impacts and potential effects of climate change, the relationship of each alternative plan to other relevant water and related land resources projects, and the relationship of each alternative plan to other existing plans.

8.1 General Considerations

Interdisciplinary Team Evaluation

An interdisciplinary team approach to the plan evaluation process can ensure the integration of engineering, economics, natural and social sciences, and the environment in a balanced manner based on the planning issues to be addressed. The disciplines of the planners are to be appropriately matched to the planning issues, and appropriate consultation and inclusion of those with specialized expertise is integral to develop a balanced plan that addresses the issues of concern.

Multi-Criterion Evaluation, Consistency & Transparency

Evaluating each plan against each criterion in a comparative manner (e.g., matrix) facilitates the planning process. Effects accounted for in one account should only be used once in order to maintain the consistency of the evaluation methodology. Not all criteria can be quantified in a similar manner, therefore clearly describing the quantified value, the range of the scale, including any weighting factor, justification for the weighting factor, and the value used, along with how the weighting factor affected the overall plan, will produce multi-criterion evaluation for each alternative plan.

8.2 REQUIRED ACCOUNTS

In order to facilitate the evaluation of the range of alternative plans, the following required accounts constitute the minimum evaluative framework necessary.

The following five accounts are used to catalogue the significant effects of an alternative on the human environment.

Public Safety (PS): The safety of populations at risk

National Economic Development (NED): The effects on the national economy

Environmental Quality (EQ): The effects on the ecological, cultural, aesthetic and other attributes of natural and cultural resources.

Regional Economic Development (RED): The effects on the regional economy, including income effects, income transfers, and employment effects not addressed in the NED account.

Other Social Effects (OSE): The effects on the urban or communities quality of life and health.

9. Plan Selection

The planning process leads to the identification of alternative plans that could be recommended or selected. These plans are referred to as the final array of plans including the required plans. The culmination of the planning process is the selection of the recommended plan from among the final array of plans, including a potential decision to take no action. The selection of the recommended plan, as with the development of alternatives, must be cognizant of the national planning objective, national mission authorities and of the availability of Federal and non-Federal resources available for water and water related resources.

9.1 Selection Criteria

National Planning Objective Criterion

The Chief of Engineers may propose a water and related land resources plan that involves Federal action only if that plan would advance the national planning objective. The goal is to formulate and propose a series of projects over time across the Nation, which together will amount in effect to an implementable national water resources plan.

Net Beneficial Effects Criterion

A recommended plan (when considered on the basis of the with-plan versus without-plan comparison) must have combined NED and beneficial EQ effects that outweigh the combined NED and adverse EQ effects. Where both benefits and costs of the plans can be quantified and expressed in monetary terms, then these values will be produced to provide information on the net beneficial effects of the plan. Where benefits cannot be monetized with reasonable accuracy, or when statutes or other authorities require non-monetary values, water and related land resource plans should present the results of an incremental cost-effectiveness analysis and otherwise continue to provide the information called for in the multi-criterion evaluation process.

Uncertainty Criterion

Where significant uncertainty regarding a future trend exists, both the option of no action and an alternative plan based on proceeding in steps, using an incremental adaptive management approach should be compared to one another, and the better of these two options should be pursued.

9.2 Project Types

Commercial Navigation & Hydropower

For commercial navigation and hydropower features, the plan with high net economic return (benefit cost ratio of at least 1.5) to the Nation for each increment of such work, consistent with protecting the environment, will be considered minimally acceptable. Plans that address the most critical needs and have an increasingly higher benefit cost ratio should be more heavily weighted in the selection process.

Flood and Storm Damage Reduction

Flood and storm damage reduction features could include structural and non-structural components. As both monetary and non-monetary values are likely to be part of the decision process when non-structural components are included, a comparative approach as identified in the Multi-Criterion Evaluation, Consistency & Transparency section will provide the clarity in these situations for decision making. Where benefits are measured in monetary values only, the plan with high net economic return (benefit cost ratio of at least 1.5) to the Nation for each increment of such work, consistent with protecting the environment, will be considered minimally acceptable. Plans that address the most critical needs and have an increasingly higher benefit cost ratio should be more heavily weighted in the selection process. Generally, when structural and non-structural components provide viable options when considering all evaluation criteria, including benefits, costs and adverse effects, preference should be given to non-structural components so long as the monetary benefits are at least at unity. If the non-monetary benefits represent a majority of the total benefits and are of National significance, then consideration can be given to selecting a plan with monetary benefits less than unity.

Aquatic Ecosystem Restoration

For aquatic ecosystem restoration features, the plan that is cost-effective, sustainable, and is the alternative plan that best reflects an appropriate level to invest for that ecosystem from a national perspective, after considering the national or regional significance and cost of protecting or restoring that ecosystem compared to others will be considered as minimally acceptable for selection. Plans that address the most critical ecological needs using the minimum action needed to substantially improve the natural functions or services with increasingly higher cost effectiveness should be more heavily weighted in the selection process.

Multiple Objectives

For multiple objective projects with features and increments of work whose benefits and costs are jointly distributed among more than one objective, each such feature or increment of work should yield a net overall return to the Nation after considering its cost, effectiveness, and other beneficial and adverse effects. Where the benefits are measured in monetary values only; those with high net economic return (benefit cost ratio of at least 1.5) to the Nation for each increment of such work, consistent with protecting the environment, will be considered minimally acceptable. Plans that

address the most critical needs and have an increasingly higher benefit cost ratio should be more heavily weighted in the selection process. Where plans have both monetary and non-monetary values, a comparative approach as identified in the Multi-Criterion Evaluation, Consistency & Transparency section is to be used to inform a decision. The monetary benefits of a multi-criteria plan must at least be unity. If the non-monetary benefits represent a majority of the total benefits and are of national significance, then consideration can be given to selecting a plan with monetary benefits less than unity.

9.3 Agency Exception

The Secretary will ordinarily consider exceptions to the selection criteria under the following circumstances: where there are overriding reasons for doing so, including safety and other Federal, State, local, Tribal, and international concerns. The reasons for an exception are to be given in a request from the Chief of Engineers and must be appropriately documented. The full planning process carried forth through the study must be documented, completed and submitted along with the documented exception in order to uphold the ideal of a transparent process.