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US principles and guidelines

Principles and guidelines for social impact assessment in the USA

The Interorganizational Committee on Principles and Guidelines for Social Impact Assessment

The 2003 version of Principles and Guidelines for Social Impact Assessment (SIA) in the USA provides guidance for the conduct of SIA within the context of the US National Environmental Policy Act of 1970. Guidelines are integrated within six principles focusing on: understanding of local and regional settings; dealing with the key elements of the human environment; using appropriate methods and assumptions; providing quality information for decision making; ensuring that environmental justice issues are addressed; and establishing mechanisms for evaluation/monitoring and mitigation. A social impact assessment model is outlined followed by suggested social impact assessment variables. The document concludes with the detailed steps in the SIA process.

Keywords: social impact assessment; principles; guidelines; steps; SIA variables; SIA model

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SINCE PASSAGE OF the US National Environmental Policy Act (NEPA) of 1970, environmental impact assessment has become the key component of environmental planning and decision making in the United States. Agency planners and decision makers have recognized a need for better understanding of the social consequences of policies, plans, programs and projects (PPPPs).

In response to this need, a group of social scientists formed the Interorganizational Committee on Guidelines and Principles for Social Impact Assessment[1] (SIA) in 1992, with the purpose of outlining a set of guidelines and principles that would assist public- and private-sector agencies and organizations to fulfill their obligations under the NEPA, related authorities and agency mandates (IOCGP, 1993). This monograph is the decade update of the original.

In the 2003 version, we continue to define social impact assessment in terms of efforts to assess, appraise or estimate, in advance, the social consequences that are likely to follow from proposed actions. These include: specific government or private projects, such as construction of buildings, siting power generation facilities, large transportation projects, managing natural resources, fish and wildlife; and preserving or leasing large tracts of land and the adoption of new policies and resulting plans

Box 1. Social impacts

By social impacts we mean the consequences to human populations of any public or private actions-that alter the ways in which people live, work, play, relate to one another, organize to meet their needs and generally cope as members of society. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalize their cognition of themselves and their society.

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and programs. The actions and their consequences are considered particularly in the context of the NEPA (P.L. 91-190, 42 U.S.C. 4371 *et seq*) and state laws and regulations that reflect NEPA.

The central requirement of NEPA is that before any agency of the federal government may take major actions potentially significantly affecting the quality of the human environment, that agency must first prepare an environmental assessment (EA) or environmental impact statement (EIS) requiring the integrated use of the social sciences. Similar requirements for state agencies are found in US States that have laws and/or regulations that reflect NEPA.

The social science components of EISs are given various labels, including social analyses, socio-economic assessments, community impact assessments, social impact assessments, or simply SIAs. The term social impact assessment first appeared when the Department of the Interior was preparing the EIS for the Trans-Alaska pipeline in the early 1970s.

Within federal agencies that have developed SIA guidelines there is variation on how the social component of NEPA is to be implemented. Prior to publishing the 1993 *Guidelines and Principles for SIA* there had not been a systematic, inter-disciplinary statement from the social science community as to what should be the content of an SIA. This version provides discretionary guidance on how to work through the SIA process in the context of the NEPA Statute and the Council on Environmental Quality (1986) NEPA implementing regulations.

The organizations and individuals in the Interorganizational Committee represent the relevant social science disciplines and design arts as well as social scientists who have done SIA in federal agencies, for the private sector, and for international donor agencies. In addition, most of the individuals do social impact assessment research and teach workshops and courses on the topic.

This document provides systematic and interdisciplinary principles and guidelines to assist government agencies and private-sector interests in using SIA to make better decisions under NEPA, related mandates and administrative requirements. The guidelines and standards provided are also designed for communities and individuals likely to be affected by proposed actions, in order that they might conduct independent assessments or evaluate the adequacy of an agency SIA.

Within these pages we cannot cover over three decades of research on social effects, much less every contingency that may occur in the course of implementing an approved action. However, we do provide a broad overview, focusing less on methodological details and more on the principles and guidelines for the preparation of technically and substantively adequate SIA within reasonable time and resource constraints.

How does SIA help in the decision process?

An SIA is focused on human environment problems and their resolution. Government policies, plans, programs, and projects are developed in response to identified or anticipated opportunities or problems. An impact assessment, whether social, economic or environmental, is a tool to help make decisions. Properly done, SIAs help the affected community or communities and the agencies plan for social change resulting from a proposed action or bring forward information leading to reasons not to carry out the proposal.

The SIA process also brings local knowledge to the decision process. Those who live in the affected area are knowledgeable about their human environment. With the use of local knowledge, SIA saves both time and money as affected populations are identified and involved in the process. It also ensures that key stakeholders are identified and consulted during decision making. Thus, SIA can help improve both the scoping and public involvement processes, which are key requirements under NEPA.

In summary, as a decision tool, SIA provides information to agencies and communities about social and cultural factors that need to be considered in any decision; provides a mechanism for incorporating local knowledge and values into the decision; and can help a decision-maker identify the most socially beneficial course of action for local, regional, and national interests.

What is new in the 2003 version?

We have benefited from almost ten years of comments and wide use of the *Guidelines and Principles* (*G&P*) *for Social Impact Assessment*. Over 3,000 copies of the 1993 version have been distributed worldwide and been reprinted in professional journals and SIA books. In addition, most federal agencies have used the *G&P for SIA* as rationale to include social impact assessment during their planning and assessment process.

The new version expands the focus away from projects to include policies, plans, and programs. These we refer to as the four Ps (PPPPs). By policies we mean general approach to such issues as immigration, hazard and contaminated waste disposal, the relocation of households, global warming and the maintenance of food stocks. By plans we mean such issues as land-use designations, growth management or the general plan used to implement a policy. Programs are the outcomes of plans; examples might be striped bass management or a program to return wild salmon to Pacific Northwest Rivers. A project would be the building of irrigation facilities to enhance agricultural development or the expansion of an airport. We use examples at all four levels throughout this document.

The next section outlines the principles that guide the assessment as well as any good social science analysis. This is followed by guidelines for doing social impact assessments. Next there is a basic model for SIA, followed by an outline of the steps in doing an SIA. We conclude with a list of applicable publications and websites. Details regarding federal mandates, a glossary of terms and a list of acronyms may be found at <www.nmfs.noaa.gov/sfa/reports.htm> and <www.socialimpactassessment.net>.

Principles for social impact assessment

The following principles guide the concepts, process, and methods for doing social impact assessment. These principles are based on expert judgment of professional sociologists, anthropologists, social psychologists, geographers, land-use planners, economists, natural resource social scientists and landscape architects. These principles are meant to ensure sound scientific inquiry and the best practices established in the field over the last three decades. Figure 1 summarizes the principles and related guidelines.

Achieve extensive understanding of local and regional settings to be affected by the action or policy
- Identify and describe interested and affected stakeholders and other parties
- Develop baseline information (profiles) of local and regional communities

Focus on key elements of the human environment
- Identify the key social and cultural issues related to the action or policy from the community and stakeholder profiles
- Select social and cultural variables which measure and explain the issues identified

Identify research methods, assumptions and significance
- Research methods should be holistic in scope, i.e. they should describe all aspects of social impacts related to the action or policy
- Research methods must describe cumulative social effects related to the action or policy
- Ensure that methods and assumptions are transparent and replicable
- Select forms and levels of data collection analysis which are appropriate to the significance of the action or policy

Provide quality information for use in decision-making
- Collect qualitative and quantitative social, economic and cultural data sufficient to usefully describe and analyze all reasonable alternatives to the action
- Ensure that the data collection methods and forms of analysis are scientifically robust
- Ensure the integrity of collected data

Ensure that any environmental justice issues are fully described and analyzed
- Ensure that research methods, data, and analysis consider underrepresented and vulnerable stakeholders and populations
- Consider the distribution all impacts (whether social, economic, air quality, noise, or potential health effects) to different social groups (including ethnic/racial and income groups)

Undertake evaluation/monitoring and mitigation
- Establish mechanisms for evaluation and monitoring of the action, policy or program
- Where mitigation of impacts may be required, provide a mechanism and plan for assuring effective mitigation takes place
- Identify data gaps and plan for filling these data needs

Figure 1. Principles and guidelines for social impact assessment

Principle 1: Achieve extensive understanding of local and regional populations and settings to be affected by the proposed action, program or policy. The use of SIA provides the best source of scientific knowledge necessary to understand the social and cultural consequences of planned and unplanned actions.

Principle 2: Focus on the key elements of the human environment related to the proposed action, program or policy. Application of the SIA process will ensure that the social and cultural concerns, values, consequences (costs) and benefits for human communities and populations will be included in the decision-making process.

Principle 3: The SIA is based upon sound and replicable scientific research concepts *and methods*. The SIA process subscribes to the ethic that good science (scholarship) will lead to informed and better decisions. To ensure the best and most appropriate methods are used, SIA practitioners should use trained and qualified social scientists. Protecting the confidentiality of study participants is a guiding tenet.

Principle 4: Provide quality information for use in decision-making. The 'good science' ethic requires the collection of quality data representative of all issues and perspectives, and holistic and transparent analyses of information and alternatives, clearly presented. To ensure the quality and completeness of information and analysis, an SIA should be peer-reviewed after scoping and prior to release.

Principle 5: Ensure that any environmental justice issues are fully described and analyzed. SIA practitioners must identify disadvantaged, at risk and minority populations (for instance, race, national origin, gender, handicap/disability and religion) affected by the proposed action, program, or policy and incorporate information about these populations in the SIA descriptions and analyses.

Principle 6: Undertake project, program or policy monitoring and evaluation and propose mitigation measures if needed. Use of the research design and databases established for the assessment of impacts should be the basis for monitoring and evaluating the actual impacts of the chosen alternative.

Guidelines for social impact assessment

In general, there is consensus, in federal and state mandates and among social impact practitioners, on: the types of impact that need to be considered; and on the need for

There is general consensus on: the types of impact to be considered; the need to include discussion of the proposed action; the components of the human environment where the impacts may be felt; likely social impacts; and the possible steps to enhance positive impacts and mitigate negative ones

the SIA to include a discussion of the proposed action. There is also general consensus on: the components of the human environment where the impacts are likely to be felt; likely social impacts; and the steps that could be taken to enhance positive impacts and to mitigate any negative ones.

Briefly, the consensus on types of impact to be considered would include social, cultural, demographic, economic, social–psychological, and sometimes political impacts. The discussion of the proposed action would describe, for example, any policy, plan, program, project or proposed facility. The consensus on the components of the human environment is that they would include descriptions and analyses of affected neighborhoods, communities and regions. The likely impacts are generally defined as the difference between the likely futures of the affected human environment with versus without the proposed action. There is also a general consensus that preferred alternatives should, when possible, avoid negative impacts and costs by appropriate modifications, efforts to minimize negative impacts and the provision of compensation for any that cannot be avoided or ameliorated.

As SIA textbooks point out (Burdge, 1999; Branch, *et al*, 1984; Taylor *et al*, 1995) and as suggested by the Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of NEPA* (CEQ, 1986), the SIA practitioner should focus on the more significant impacts, should use appropriate measures and information, should provide qualitative and quantitative indicators where feasible and appropriate, and should present the social impacts in a manner that can be understood by decision-makers and affected communities alike.

The following guidelines are derived from the principles in the previous section. They are benchmarks for conducting an SIA. The principles are restated for clarity and flow of the discussion.

Principle 1. Achieve extensive understanding of local and regional settings to be affected by the action or program or policy

Guideline 1a. Identify and describe interested and affected stakeholders and other parties. Because different social groups have a 'stake' in the outcomes associated with public- and private-sector actions, the assessor must be proactive in identifying these social groups (stakeholders) and understand their interests and values. Through public involvement, the SIA practitioner begins to understand the local context and identify and involve all potentially interested and affected groups at the very early stages of the assessment process.

Public involvement can facilitate the SIA process by identifying potentially affected groups, and by providing an opportunity to hear the 'meaning' of social and biophysical impacts. Public involvement is crucial in recruiting participants for the planning process who are truly representative of affected groups. However, involvement must be truly interactive with communication flowing both ways between the proponent agency and affected parties.

Guideline 1b. Develop baseline information (profiles) of local and regional communities. The community profile is a 'map' of the existing conditions and past trends associated with the human environment in which the proposed action is to take place. The terms community profiles and the baseline study are here used interchangeably. Baseline simply means a time line and associated social, cultural and community information from which to start the assessment.

For example, with construction projects, a geographical area is identified along with the distribution of special populations at risk. For policies, plans, programs, or other special assessments (for instance, technology, health, natural resources management), the relevant human environment may be a dispersed collection of interested and affected parties, pressure groups, organizations, and institutions. Typically, community and regional profiles include population and other demographic information, economic and employment data, descriptions of social and cultural institutions and their relationships to community and regional life, and an accounting of both social and economic capital and their distribution in the community and region.

Principle 2. Focus on key elements of the human environment

Guideline 2a. Identify the key social and cultural issues related to the action or policy from the community and stakeholder profiles. NEPA regulations require public involvement in order to identify key issues for focusing the assessment of impacts (and eliminating or minimizing less important issues). SIA practitioners must contend with stringent time and resource constraints that affect the scope of the assessment and what can be achieved in the time available. Given such constraints, a central question emerges: "If you cannot cover the social universe, on what should you focus?" The answer is, first, the most significant impacts in order of priority, and secondly, all significant impacts for all interested and affected parties must be identified early using a variety of rapid appraisal or public involvement techniques.

Impacts identified by the public: Clearly, impacts identified as important by the public must be given high priority. Many of these will surface during the NEPA scoping process; however, as noted earlier, some groups low in power that may be adversely affected are rarely early participants in the planning process. It is essential that broadly based public involvement occur throughout the SIA process, but additional means (for instance, key informants, participant observation and, if funds and time are plentiful, surveys of the general population) often must be used to ensure that the most significant public concerns are addressed.

Impacts identified by SIA practitioners: SIA practitioners have the expertise to help prioritize impact issues using a review of the SIA literature, analysis of similar settings, and professional experience. These professionals will suggest issues unrecognized or unarticulated by either the general public or the agencies.

Provide feedback on social impacts: Identify issues that could be solved with changes to the proposed action or alternatives early in the process. Findings from the early SIA stages should feed back to the project planners and thus into the design of the proposed action to minimize adverse impacts and enhance positive impacts. The assessment process, therefore, should be designed as a dynamic one involving cycles of design, assessment, redesign, and reassessment.

This process should be conducted before the agency becomes strongly committed to some form of action. Therefore, it may need to be carried out informally with agency planners prior to publication of the assessment for public comment. Public input early in the process appears to be very influential.

Guideline 2b. Select social and cultural variables that measure and explain the issues identified. SIA variables point to measurable change in human populations, communities, and social relationships resulting from a proposed action. Social impact assessment variables can be grouped under the general headings of: population change; community and institutional structures; political and social resources; community and family changes; and community resources.

While the social profiles of communities and regions will contain as much information as possible on a wide variety of social variables, the SIA must focus on the action proposed and the human environment involved. Not all SIA variables (issues) identified by the public and SIA practitioners will have sufficient information to satisfactorily measure and explain potential changes and issues identified. Often it will be necessary to triangulate impacts using a variety of variables assessed with different measures. Social and cultural assessment variables are outlined in the next section under "A basic model for social impact assessment".

Principle 3. Identify methods and assumptions and define significance

Guideline 3a. Research methods should be holistic in scope, that is, they should describe all aspects of social impacts related to the proposed action. The methods and assumptions used in the SIA should be summarized in the draft environmental impact statement or environmental assessment to allow decision makers and affected publics to evaluate the assessment process (as required by NEPA).

Practitioners will need to consult the CEQ Regulations. Definitions and examples of effects (primary, secondary and cumulative) are provided in 40 CFR 1508.7 and 1508.8 (CEQ, 1986). In these regulations "effects" and "impacts" are used synonymously. The CEQ Regulations are clear that an EIS has to focus on impacts found to be "significant" and Section 1508.27 defines significance in terms of "context" and "intensity" considerations. Context includes such considerations as society-as-a-whole, affected regions, affected interests and locality (for instance, when considering site-specific projects, local impacts assume greater importance than those of a regional nature).

The probable social impacts will be formulated in terms of predicted conditions without the actions (baseline condition), the predicted conditions with the actions and the predicted impacts that can be interpreted as the difference between the future with and without the proposed action. The empirical procedure is based on the social impact assessment model outlined below (Figure 2 in the next section).

Investigation of the probable impacts involves five major sources of information: detailed data from the sponsoring agency on the proposed action; the record of previous experience with similar actions as represented in the literature including other EIAs/SIAs; census and vital statistics; documents and secondary sources; and field research, including informant interviews, public hearings, group meetings and, if funds are available, surveys of the potentially impacted population. The investigation of the social impacts identified during scoping is the most important component.

SIA should use easily understood methods and assumptions that can be duplicated in similar settings: information must be collected using accepted social science methods and assumptions, and must be subjected to independent, formal peer-review

Guideline 3b. Research methods must describe secondary and cumulative social effects related to the action or policy. Cumulative impacts are those that result from the incremental impacts of an action added to other past, present, and reasonably foreseeable future actions regardless of which agency or person undertakes them (see CEQ, 1986, 40 CFR 1508.7). A community's residential and retail growth and pressures on government services following the locating of a highway interchange are examples of secondary impacts. Cumulative impacts would add historical events in the vicinity of the interchange to the mix.

While they are more difficult to estimate precisely than primary impacts, it is very important that secondary and cumulative impacts be clearly identified in the SIA. CEQ (1997b) has prepared a *Cumulative Effects Handbook* which provides guidance on the subject and is available on-line on NEPA net (<http://ceq.eh.doe.gov/nepa/nepanet.htm>).

Guideline 3c. Ensure that methods and assumptions are transparent and replicable. Good scientific and research practice requires that any SIA should use methods and assumptions that are easily understood and can be duplicated in other similar settings. The Data Quality Act (2001) [P.L. 106-554, §515] reinforces this practice for any influential information and data, such as that used in environmental assessments or SIAs for federal actions, and guidance has been issued by the Office of Management and Budget [*Federal Register* 67(36), pages 8451–8460].

Information must be collected using accepted social science methods and assumptions, and must be subjected to an independent, formal peer-review before it can be used. Where data are to be kept confidential, the researcher must document the research design, methods and means of analysis and these must also be peer-reviewed to ensure that the methods and assumptions are transparent and replicable.

Guideline 3d. Select forms and levels of data collection and analysis that is appropriate to the significance of the

action or policy. Published scientific literature and primary and secondary data from the affected area are the three sources of data for all SIAs. Balance among the three may vary according to the type of the proposed action, as well as specific considerations noted below, but all three will be relevant. The SIA practitioner must be sure, for federal projects, that any information and data used meet the requirements for the Data Quality Act (2001).

Published scientific literature The SIA should draw on existing, previously reviewed and screened social science literature that summarizes existing knowledge of impacts based on accepted scientific standards. Examples include journals, books and documents available from similar projects. A list of easy to obtain and recommended sources is provided in the bibliography. Existing documentation is needed in identifying which social impacts are likely to accompany the proposed action. When it is possible to draw potentially competing interpretations from the existing literature, the SIA should provide a careful discussion of relative methodological merits of available studies.

As pointed out under "A basic model for social impact assessment" in the next section, the best guidance for future expectations is past experience. Therefore, consideration of existing literature should err on the side of inclusiveness, not on exclusion of potentially relevant cases. Caution is needed when the SIA presents a conclusion that is contradicted by the published literature; in such cases, the reasons for the differences should be explicitly addressed. For example, anthropological data on rural, and ethnically and racially diverse communities is best for understanding the cultural context of the impacted community.

Secondary data sources The best sources are the Bureau of Census, and vital statistics, geographical data, and routine data collected by state and other federal agencies. Examples of other secondary data sources include: agency caseload statistics (for instance, from mental health centers, social service agencies and other human service providers, law enforcement agencies, and insurance and financial regulatory agencies); published and unpublished historical materials (often available in local libraries, historical societies, and school district files); compilations produced by service organizations (such as chambers of commerce, the better business bureaux, tourist offices, social organizations, and church groups); and the files of local newspapers.

These secondary sources can be used in conjunction with key-informant interviews, to allow for verification of informant memories and of potential sources of bias in the available documentary record.

Primary data from the affected area Survey research, oral histories and informant interviews are examples of primary data that may be collected to verify other findings. If a social assessor concludes that community impacts will differ from those documented elsewhere, this decision must be based on the collection and analysis of primary data that specifically show why such alternative conclusions are more credible. Local residents are an important source of expertise, both about local social and economic conditions and the broader range of likely impacts from a proposed action. If a community has a particularly unique history and structure, it may react to a development event or policy change differently than other communities. Following a basic tenet of social science research the practitioner must protect the confidentiality of study participants.

Principle 4. Provide quality information for use in decision-making

Guideline 4a. Collect qualitative and quantitative social, economic and cultural data sufficient to usefully describe and analyze all reasonable alternatives to the action. Within the boundaries of good scientific and research practice, it is more important to identify likely social impacts than to precisely quantify the more obvious social impacts. All assessors strive to identify and quantify significant impacts, thereby providing decision makers and the affected public with information that is both as complete and as accurate as possible.

In cases where this desirable goal cannot be met, it is better to be roughly correct on important issues than to be precisely correct on unimportant ones. Within the context of the social impact statement, there are two important differences between impact identification (what are the general categories or types of impact that are likely to occur) and impact evaluation (precisely how 'significant' are those impacts likely to be?).

Research has identified social impacts resulting from many types of action, and the experienced SIA practitioner can identify plausible and potentially significant impacts relatively quickly and efficiently. On the other hand, an accurate evaluation is a resource-intensive process and deals with the question of significance. Research on the decision-making process has found that experts and policy makers were particularly prone toward premature closure.

Given a partial listing of potential impacts, experts tended to assume they have been given a complete list and, in most cases, fail to recognize the potential impacts that have been omitted from consideration. While empirical estimates can appear to be quite precise, demographic and economic projections have been shown by empirical analysis to have an average absolute error in the range of 50–100%.

We support the use of qualitative and quantitative measures of social impact assessment variables, but realize that the evaluation of significance has an important judgment component. The OMB (2001) Guidance to the Data Quality Act [*Federal Register* 67(36), pages 8451–8460] and the subsequent guidance issued by the federal agency sponsoring the action will assist the SIA practitioner in setting appropriate levels of significance for data analysis.

It is important to be on the 'conservative' side in reporting likely social impacts. The purpose of the EIS is to provide an even-handed treatment of the potential for impacts, offering a scientifically reasonable assessment of this potential in advance of the proposed action. It is a very different matter from providing solid proof of impacts after all the evidence is in!

All EISs and SIAs are by their nature anticipatory. Therefore, questions about the 'proof' of impacts cannot be answered with true confidence in advance of the actions in question. Accordingly, if the evidence for a potential social and economic impact is not definitive in either direction, the 'conservative' conclusion is that the impact cannot be ruled out with confidence, and not that the impact 'is not proven.' In cases of doubt, in terms of statistical terminology, the proper interpretation is the

Type II test for power/sensitivity, and not the Type I test for the strength of consistency of an association.

Guideline 4b. Ensure that the data collection methods and forms of analysis are scientifically robust. The fewer reliable data there are on the human environment effects of projects or policy change, the more important it is to have the SIA work performed by competent social scientists. There are two possible exceptions to the rule-of-thumb that SIA practitioners be trained social scientists.

In some cases, proposed actions are considered by reasonable persons (specifically those within the agency with demonstrated social science and SIA expertise and those in the potentially effected community) to be likely to create only negligible or nonexistent impacts on the human environment. In these situations, a finding of no significant impact (FONSI) would be issued by the agency and an environmental assessment (EA) would be conducted instead of an EIS.

In other cases a significant body of empirical findings is available from the social science literature that can be applied relatively directly to the proposed action in question, and should be referenced, summarized, and cited by the person(s) preparing the SIA section of the EIS.

Thus, the rigor of SIA data collection and analysis requires the use of professional social science expertise and inclusion of the relevant literature. Any other course would be imprudent for both the agency and affected groups and communities.

Guideline 4c. Ensure the integrity of collected data. Both good scientific and research practice and the provisions of the 2000 Data Quality Act ensure the integrity of collected data. Trained social scientists employing social science methods will provide the best results and the most legally defensible. The courts have demonstrated deference to agency scientists in exercising their expert judgment.

To ensure integrity of the SIA process, the need for professionally qualified, competent people with a social science background cannot be overemphasized. Protection of the confidentiality of collected data is also key to integrity. However, the assessor must remember his/her responsibilities under the Freedom of Information Act (FOIA) in planning the assessment design.

An experienced SIA practitioner will 'know the data,' and be familiar and conversant with existing social science evidence pertaining to impacts that have occurred elsewhere and therefore are relevant to the impact area in question. This breadth of knowledge and experience can prove invaluable in identifying important impacts that may not surface as public concerns or as mandatory considerations found in agency NEPA compliance procedures. A social scientist will be able to identify the full range of important impacts and select the appropriate measurement procedures.

Having a social scientist as part of the EIA/SIA team will also reduce the probability that an important social impact could go unrecognized. In assessing social impacts, if the evidence for a potential type of impact is not definitive in either direction, then the appropriate conservative conclusion is that it cannot be ruled out with confidence. In addition, it is important that the SIA practitioner be conversant with the technical and biological perspectives brought to bear on the project, and the cultural context of the agency in which he/she works.

The SIA practitioner should identify disadvantaged, at risk and minority populations, describe and measure their social and cultural characteristics, and incorporate this information into the SIA and the baseline data sets

Guideline 4d. Gaps in data or information. SIA practitioners may be required to produce an assessment in the absence of relevant or even necessary data. The three elements of this guideline are intended to supplement the guidance already provided by CEQ (1986) 40 CFR 1502.22, as amended by the removal of the requirement for a "worse-case analysis" (*Federal Register* 51, No. 80, Friday, April 25, 1986, pages 15818-626):

> "When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking. (a) If the incomplete information … is essential to a reasoned choice among alternatives and (b) the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement."

Only if the relevant information "cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known," is the EIS permitted a gap in relevant information. In such cases, moreover, the EIS needs to include:

> "(1) a statement of relevance of the incomplete or unavailable information … (2) a summary of existing credible scientific evidence [that] is relevant …, and (3) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community." (CEQ, 1986, 40 CFR 1502.22)

Principle 5. Ensure that any environmental justice issues are fully described and analyzed

Guideline 5a. Ensure that research methods, data, and analysis consider underrepresented and vulnerable stakeholders and populations. The Executive Order 12898 on Environmental Justice (Executive Office of the President of the United States, 1994) requires federal agencies to consider the impacts of any action on disadvantaged, at risk and minority populations. In the course of the SIA, the practitioner should take care to identify these special populations, describe and measure their social and cultural characteristics, and incorporate this information into the SIA and the baseline data sets. The assessor should be

alert for different social meanings of environmental impacts as interpreted through the values of these different groups.

Examples abound in the literature of special populations that could be considered poor, sensitive, vulnerable and/or low-powered. The elderly have been identified as a category of persons sensitive to involuntary displacement and relocation. Children have suffered learning problems resulting from long-term exposure to various forms of transportation noise (for instance, vehicular traffic, rapid rail). Minority and low-income persons in the 1960s were disproportionately targeted as optimal sites for road construction, waste disposal sites and similar undesirable land uses.

Persons with some form of disability or impairment constitute another sensitive category with important needs. Farmers often are affected by transmission lines, water projects, or housing and commercial developments that take large amounts of land. Commercial fishers are often impacted by coastal and harbor development that restricts fishing opportunities or reduces available dock space.

Women have different financial, health and social concerns and may be vulnerable to changes in community focus. For example, a change from a textile manufacturing base (employing women) to a power plant (employing men) could lead to significant unemployment. The reverse could happen if the local economy changes from logging to tourism. The special impacts on these populations should be highlighted in an SIA, not lost in undifferentiated summary statistics.

Guideline 5b. Clearly identify who will win and who will lose, and emphasize vulnerability of under-represented and disadvantaged populations. Impacts should be specified for differentially affected populations and not just measured in the aggregate. Identification of all groups likely to be affected by a proposed action is central to the concept of impact equity. There will always be 'winners' and 'losers' (benefits and burdens) as the result of a decision to construct a dam, build a highway or close an area to timber harvesting. However, no category of persons, particularly those that might be considered more sensitive or vulnerable as a result of age, gender, ethnicity, race, occupation or other factors, should have to bear the brunt of adverse social and biophysical impacts.

While most proposals are not zero-sum situations and there may be varying benefits for almost all involved, the SIA practitioner has a special duty to identify those whose adverse impacts might be lost in the aggregate of benefits. The assessor must be attentive to those groups that lack political efficacy; such 'low-powered' groups often are not heard and therefore do not have their interests properly represented.

Principle 6. Undertake evaluation/monitoring and mitigation

Guideline 6a. Establish mechanisms for evaluation/monitoring of the proposed action that involve agency and stakeholders and/or communities. Crucial to the SIA process is the monitoring of significant social impact variables and the mitigation programs that have been put in place. As indicated earlier, the identification of impacts might depend on the specification of contingencies. For example, if the in-migration of workers during the construction phase is a work force of 1,000, special and additional housing will be needed, but if it is only 50 and the community is large, present accommodation may be sufficient.

Identifying and monitoring infrastructure needs is a key element of the local planning process. Two important points are: monitoring and mitigation should be a joint agency (proponent)–community responsibility; and both activities should occur on an iterative basis throughout the project life cycle (Figure 3).

Depending on the nature of the proposal and time horizons for completion/implementation, the focus of long-term responsibility for monitoring and mitigation is not easily defined. Research shows that trust and expertise are key factors in choosing the balance between proponent and community monitoring activities. Few federal agencies have the resources to continue monitoring for an extended period and therefore local communities should be provided resources to assume a portion of the monitoring and mitigation responsibilities.

Guideline 6b. Where mitigation of impacts is required, provide analyses and assessments of alternatives. A social impact assessment not only forecasts impacts, it should identify means to mitigate adverse impacts. Mitigation includes: avoiding the impact by not taking or modifying an action; minimizing, rectifying, or reducing the impacts through redesign or operation of the project or policy; or compensating for irreversible impacts by providing substitute facilities, resources, or opportunities (see CEQ, 1986, 40 CFR 1508.20; and under "Steps in the social impact assessment process").

Ideally, mitigation measures are built into the selected alternative, but it is appropriate to identify them even if they are not immediately adopted or if they would be the responsibility of another organization or government unit. Also, if an agency prepares an EA and identifies potentially significant social impacts, then that agency will be required to identify and implement mitigation measures to reduce the impact(s) below the threshold of significance if they wish to implement the action based on a FONSI rather than go on to prepare an EIS.

Guideline 6c. Identify data gaps and assess data needs. As the SIA progresses, data gaps and related methodological problems will emerge. These should be fully documented and incorporated with the findings of the SIA. For example, in natural resource management agencies, federal actions and programs will be changed and modified over time necessitating development of a new SIA. Knowledge of data gaps and data needs permit agencies to collect new information and to build baseline data sets.

A basic model for social impact assessment

Link between EIA and SIA

Impacts on human environment both resemble and differ from biophysical impacts.

- Social impacts can vary in desirability, ranging from the positive to the adverse.
- They also vary in scale — the question of whether a facility will create 50 or 1,000 jobs, for example, or

whether it will have the potential to spill 50 or 1,000 gallons of toxic waste.

- Another consideration involves the extent or duration of impacts in time and space. Like biophysical impacts, some social impacts can be of short duration, while others can last a lifetime; and some communities 'return to normal' quite quickly once a source of disruption is removed, while others do not.
- Social impacts can also vary in intensity or severity, a dimension that may be defined differently in a different context, just as the same 'objective' biophysical impact (for instance, a predicted loss of 75 sea otters) might have an almost imperceptible effect on populations in one location (for example, off the coast of Alaska) while amounting to a significant fraction of the remaining population in another location (off the coast of California).
- Similarly, there are differences in the degree to which social impacts are likely to be cumulative, at one extreme, or mutually counterbalancing, at the other.

In addition, it is important to consider the social equity or distributions of impacts on different populations. Just as the biological sections of EISs devote particular attention to species having special vulnerabilities, the social and economic sections of EISs must devote particular attention to the impacts on vulnerable and disadvantaged segments of the human population. Examples include: the poor, the elderly, adolescents, or unemployed women; members of minority and/or other groups that are racially, ethnically, and/or culturally distinctive; or occupational, cultural, political or value-based groups for whom a given community, region, or use of some component of the biophysical environment is particularly important.

In addition to the types of disturbance that can affect other species, humans are affected by changes in the distinctly human environment, including those associated with the phenomenon referred to as the 'social construction of reality'. Social constructions are not mere perceptions or emotions, to be distinguished from reality; rather, how we view a social situation determines how we behave. Furthermore, social constructions of reality are characteristic of all social groups, including the agencies that are attempting to implement change as well as the communities that are affected.

In the case of proposed actions that involve controversy (attitudes and perceptions toward a proposed policy change are one of the variables that must be considered in determining the significance of impacts (CEQ, 1986, 40 CFR 1508.27(4)), participants are often tempted to dismiss the concerns of others as being merely imagined or perceived. There are two important reasons not to omit such concerns from SIAs and EISs. First, the positions taken by all sides in a given controversy are likely to be shaped by (differing) perceptions of the proposed action. The decision to accept one set of perceptions while excluding another may not be scientifically defensible. Second, if a proponent asserts that their critics are emotional or misinformed, for example, they are guaranteed to raise the level of hostility between themselves and community members and will stand in the way of a successful resolution of the problem.

In summary, some of the most important aspects of social impacts involve not, for example, the physical relocation of human populations, but the meanings or significance attached to these changes.

We use a comparative SIA method to study the course of events in a location where planned environmental change has occurred and to extrapolate from that analysis what is likely to happen in another location where a similar action is proposed

Social impact assessment model

To predict the probable impact of development, we seek to understand the behavior of individuals and communities affected by agency developments or policy changes. We use a comparative SIA method to study the course of events in a location where planned environmental change has occurred and to extrapolate from that analysis what is likely to happen in another location where a similar action is proposed. As shown in Figure 2, if we wish to know the probable effects of a proposed power plant in location (b), one of the best places to start is to assess the effects of a power plant that is operational in location (a). Example SIA variables to access impacts are shown later in this section.

It is almost impossible to catalogue all dimensions of social impacts because change has a way of creating other changes. A freeway extension that facilitates residential growth can lead to increased traffic and air pollution, creation of new schools, retail centers and other services, and the decline of downtown commercial centers.

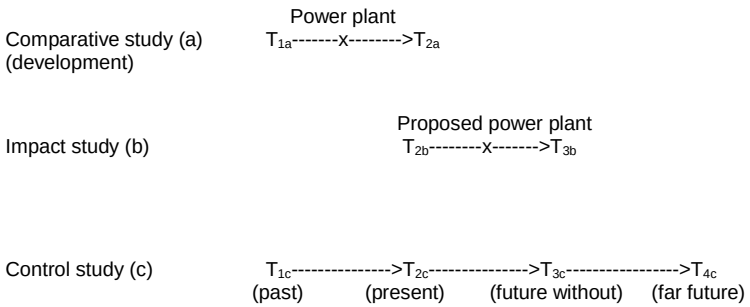

Figure 2. Basic social impact assessment model

In Table 1 (later in this section) we have identified some basic social dimensions that can be measured; they reflect fundamental and important characteristics of a community. Studied over time, these characteristics give us insight as to how social structure will be altered when change occurs. Faced with a proposal to implement a new ski area, for example, the community and the agency proposing the change can profit from the experience of other communities that have developed ski areas and thereby gain a reasonably accurate expectation of how the project will affect their community.

Forecasted impacts are the difference in the human environment between a future with the proposed action and a future without (see Figure 2). Since we cannot see the future, we look at other communities that have experienced similar policies or projects in the past. Thus, the social impact assessment model is comparative — the social impacts in one community may be projected to a location where a similar action is proposed. The model in Figure 2 also permits a follow-up SIA of the impacted community to assess what the actual impact has been, so that the fit between forecasts and outcome can be matched (the difference between T_{1a} and T_{2a}).

One way to capture the dynamic quality of something as far-reaching and complex as social impacts is to metaphorically take a series of snapshots over time as implementation of the agreed action unfolds and fill in what happened in between. Ideally, information about the community or geographic area of study is available both before and after the event to help in measurement. Social impacts then become the changes taking place between the two measurement points (T_{2b} and T_{3b}). The social assessor then attempts to forecast the change associated with the proposed action based on the research and information accumulated from comparative studies of similar impact settings (T_{1a} and T_{2a}).

Based on the directives outlined in NEPA and the CEQ regulations, we also need to identify irreversible and undesirable social effects of development before they occur to make recommendations for mitigation. As we point out in a later section, the appropriate federal agency in cooperation with state and local governments and the local community bears responsibility for coordinating mitigation efforts. The SIA model also allows us to address the issue of alternative plans and alternative impacts of a proposed action. Moreover, because social impacts can be measured and understood, recommendations for mitigating actions on the part of the agencies can be made. In the next section we outline a procedure for mitigating potentially adverse impacts.

Another strength of the comparative SIA model is that, with appropriate data sources (those that can be collected frequently, such as, land transfer records, population and employment numbers), it allows for a dynamic interpretation of events and can provide monitoring of short-term impacts. Moreover, this kind of frequent monitoring provides a continual source of evaluation or check on the direction of forecasts made about social impacts.

Stages in policy/project development

All projects go through a series of steps or stages, starting with initial and detailed planning (to include impact assessment), followed by implementation and/or construction carrying through to operation and maintenance (Figure 3). At some point the implemented action might be abandoned or decommissioned, or official policy could change. Social impacts will be different for each stage.

Scoping of issues prior to analysis may lead the assessor to focus only on one stage. For example, one community might be concerned about public reaction resulting from a proposal to site a hazardous waste disposal facility, another with the construction aspects of reservoirs, while a third might be faced with a change in the designation of adjacent public land from timber production to wilderness use. The specific stage is an important factor in determining impacts; and not all social (or biophysical) impacts will occur at each stage. Figure 3 illustrates the stages in federal agency planning and implementation.

Stage 1. General planning/policy development and preliminary impact assessment Social impacts actually begin the day the proposed action is announced and can be measured from that point. We often assume that no impacts will take place until stage 3 (construction/ implementation begins) through dirt-moving operations or, for example, restrictions on water use. However, real, measurable, and often significant impacts on the human environment begin to take place as soon as there are changes in social or economic conditions following announcement. From the time of the earliest announcement of a pending policy change or rumor about a project, both hopes and hostilities can begin to mount; speculators can lock up potentially important properties, politicians can maneuver for position, and interest groups can form or redirect their energies. These changes occur by merely introducing new information into a community or region.

Depending upon the proposed action, activities in this stage include: creation of a public involvement program; system planning; preliminary project concept; attentive action design; notification of both public officials and the general public and gathering their input; relevant 'outside' agency contacts and gathering their input; preliminary 'fatal flaw' impact assessment; preliminary work toward acquisition of property or right-of-way permits; licensing;

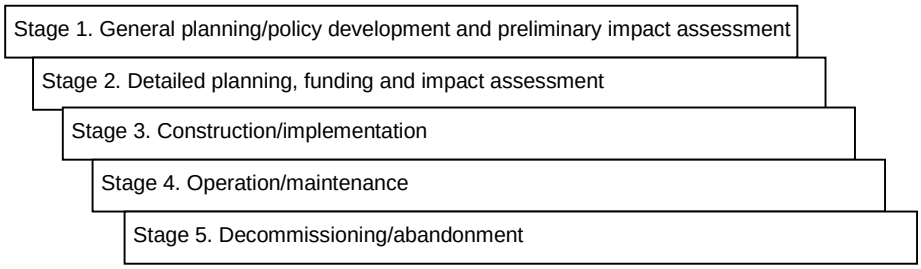

Figure 3. Stages in project/policy development

and groundwork for any necessary changes in laws, regulations, or procedures. Basic policy decisions, such as the mix of problem solutions and prioritizations of implementation, are determined. These policy decisions determine the benefits and burdens of, and to, individuals and communities that are immediately and ultimately impacted.

Stage 2. Detailed planning, funding and impact assessment Once the local land-use plan is in place, reality and fiscal aspects come into play. Prioritized implementation activities with designated funding sources guide these more detailed activities. As funds and funding sources are recognized, more detailed project planning takes place, including the assessment of social impacts. Examples include detailed project design, revision, continuing public input, licensing, evaluation of alternatives and their varied impacts, and, ultimately, the decision to proceed with the proposed action or an alternative.

Stage 3. Construction/implementation The construction/implementation stage, begins when a decision is made to proceed, a permit is issued or a law or regulation takes effect. For typical construction projects, this involves clearing land, building access roads, developing utilities, and so on. Acquisition of needed right of way, displacement and relocation of people, if necessary, occur during this phase.

Depending on the scale of the project, the buildup of a migrant construction work force also may occur. If significant in-migration occurs, the new residents may create a strain on community infrastructure, and social stresses as a result of changing patterns of social interaction. Communities may have difficulties in responding to the increased demands on school, health facilities, housing and other social services. Further stresses may be created by resentments between newcomers and long-term residents, by sudden increases in the prices for housing and local services, and even by increased uncertainty about the future.

Stage 4. Operation/maintenance The operation/maintenance stage occurs after the construction is complete and/or the policy is fully operational. In many cases, this stage will require fewer workers than the construction/implementation phase, and, particularly if operations continue at a relatively stable level for an extended period of time, the effects during this stage can often be the most beneficial of any stage. Communities seeking industrial development will often focus on this stage, for example, because of the long-term financial benefits that may follow. It is also during this stage that the communities can adapt to new social and economic conditions, accommodation can take place and the expectations of positive benefits, such as stable population, quality infrastructure and employment opportunities, can be realized.

In natural resource management, the operational stage will see shifts in activities by stakeholders. Where resource allocation is insufficient to support previous operations, consolidation will occur or stakeholders will switch to alternative activities. In farming, grazing or forestry, land may be sold or leased, thus reducing the number of operators. Alternatively, small stakeholders may stay in business but supplement their income with second jobs, or, in the case of commercial fishing, switch to other fisheries.

The projects and policy decisions that require, and benefit from, SIA range from prison and plant sitings to highway, reservoir, power plant construction, and managing old growth forests to maintain a biologically diverse region

Stage 5. Abandonment/decommissioning Abandonment/decommissioning begins when the proposal is made that the project or policy and associated activity will cease at some time in the future. As in the planning stage, the social effects of decommissioning begin when the intent to close down is announced and the community or region must again adapt, but this time to the loss of the project or an adjustment to a policy change.

Sometimes this means the loss of the economic base as a business closes its doors. At other times, the disruption to the local community may be lessened or at least altered if one type of worker is replaced by another. Such a case was the 1994 closing of the Hanford Facility in Washington State, where nuclear production facilities closed down, but employment actually increased as environmental cleanup specialists were hired to help deal with the contamination at the facility.

In other cases, disruption may be exacerbated if the community is not only losing its present economic base, but has lost the capacity to return to a former economic base. Morgan City, Louisiana which had been the self-proclaimed “shrimp capital of the world” in the 1950s is a good example of this. During the 1960s and 1970s, employment in this community shifted to offshore oil development. When oil prices collapsed in the 1980s, the community found it could not return to the shrimp industry because shrimp-processing facilities had closed down, and most of the shrimp boats had been allowed to decay or their crews had left the area.

Policy and project decision settings

The projects and policy decisions that require, and benefit from, social impact assessment range from prison and plant sitings to highway, reservoir, power plant construction, and managing old growth forests to maintain a biologically diverse region. Accordingly, the location of proposed actions may range from isolated wilderness areas to urban neighborhoods, each with special characteristics that can affect social impacts.

Social impacts (and economic and biophysical changes) will vary depending on the type of activity and existing social structure. The following examples of policies, plans, programs and projects (PPPPs) were taken from the *Digest of Environmental Impact Statements*, which is a cumulative listing of all the environmental impact statements done by federal agencies in the USA.

- mineral extraction, including surface and underground mining, and new oil and gas drilling;

- federal health-care policies to include social security, Medicare and Medicade;
- hazardous and sanitary waste sites, including the construction and operation of disposal sites for a variety of hazardous and sanitary wastes (also included are facilities that burn or otherwise destroy chemical and toxic wastes);
- power plants including both nuclear and fossil-fuel electrical generating facilities and associated developments;
- reservoirs, including all water impoundments for flood control, hydro power, conservation, recreation, and cooling lakes and diversion structures;
- industrial plants (manufacturing facilities built and operated by the private sector, for instance, refineries, steel mills and assembly lines);
- land-use designations, such as, zoning activity, comprehensive growth-management plans, and the reclassification of land use (timber production to wilderness);
- living natural resource management plans, including fisheries, endangered species, bird and wildlife, and range and forest;
- military and governmental installations, including base closures and openings;
- schools; both public and private, primary, secondary and university;
- transportation facilities, including airports, streets, terminals;
- linear developments, including subways, railroads, highways, power lines, aqueducts, bike paths, bridges, pipelines, sewers, fences, walls and barrier channels, green belts, waterways;
- trade facilities, including businesses, shopping centers;
- designation of sacred sites;
- parks, preserves, refuges, cemeteries, recreation areas;
- housing facilities, including apartments, office buildings, hospitals.

Identifying social impact assessment variables

SIA variables point to measurable change in human population, communities, and social relationships resulting from a proposed action. Based on a half century of research on local community change, rural industrialization, reservoir and highway development, natural resource development, and social change in general, we outline a list of social variables under the general headings of: population change; community and institutional structures; political and social resources; community and family changes; and community resources (Table 1).

- Population change refers to present population and expected change; ethnic and racial diversity, influxes and outflows of temporary residents, and the arrival of seasonal or leisure residents.
- Community and institutional structures mean the size, structure, breadth and level of organization of local government, and linkages to the larger political systems. Also included are historical and present patterns of employment and industrial diversification, the size and level of activity of voluntary associations and interest groups, religious organizations and, importantly, how these institutions relate to each other.
- Political and social resources refer to the distribution of power authority, the identification of interested and affected parties, and the leadership capability and capacity within the community or region.
- Community and family changes refer to factors that influence the daily life of individuals and families, including family living and work arrangements, attitudes, perceptions, family characteristics and friendship networks. These changes range from attitudes toward the policy to an alteration in family and friendship networks and perceptions of risk, health, and safety.
- Community resources include patterns of natural resource and land use, and the availability of housing and community services to include health, police and fire protection and sanitation facilities. A key to the continuity and survival of human communities is their historical, archaeological and cultural resources. Under this collection of variables we examine possible changes for indigenous populations and religious sub-cultures.

At this point in the discussion of an SIA model we have demonstrated a conceptual procedure for both examining and accumulating information about social impacts. We have also outlined a matrix that demonstrates that social impacts will be different depending on the project/policy type and the stage of development. The next step in the development of the model is to suggest the social impact variables for stages in project development given different project/policy types and settings.

SIA variables, project/policy stage and setting

The five stages of project/policy development affect the social processes that produce changes in characteristics of the community or region. The SIA specialists must construct a matrix to direct their investigation of potentially significant social impacts. Sample matrices are shown in Tables 1 and 2. For each project/policy stage, the assessor should identify potential impacts on each SIA variable identified in the matrix. This approach ensures that no critical areas are overlooked.

We emphasize that Table 1 does not represent all social impact assessment variables that may be of interest for any project. It is presented to illustrate the issues that represent the beginning of such a task. The task for the assessor is to spell out the magnitude and significance of impacts for each cell like those identified in the illustrations.

Table 2 provides an abbreviated illustration of how the SIA variables (as suggested in Table 1) might be applied within the context of both the setting type and the stage of the SIA process. The first example is the siting of a hazardous waste facility. Perceptions about problems of public health and safety, and concerns as to how different agencies work together could emerge during the planning stages. If a decision is made to go ahead, construction would be accompanied by an influx of temporary workers. In the case of the new highway, displacement and relocation concerns will surface during planning and safety concerns during the operational stage. These analytic procedures would be repeated for each of the SIA variables for each stage in the assessment process. The procedures for accomplishing this task are outlined the next section on steps in the SIA process

Steps in the social impact assessment process

The social impact assessment itself may contain the ten steps outlined in Figure 4. These steps are logically

Table 1. Matrix relating project stage to social impact assessment variables

Social impact assessment variables[a]	General planning, policy development preliminary assessment	Detailed planning, funding & impact assessment	Construction implement	Operation/ maintenance	Decommission/ abandonment
Population change					
Population size density & change					
Ethnic & racial comp. & distribution					
Relocating people					
Influx & outflows of temporaries					
Presence of seasonal residents					
Community & institutional structures					
Voluntary associations					
Interest group activity					
Size & structure of local government					
Historical experience with change					
Employment/income characteristics					
Employment equity of disadvantaged groups					
Local/regional/national linkages					
Industrial/commercial diversity					
Presence of planning & zoning					
Political & social resources					
Distribution of power & authority					
Conflict newcomers & old-timers					
Identification of stakeholders					
Interested and affected parties					
Leadership capability & characteristics					
Interorganizational cooperation					
Community and family changes					
Perceptions of risk, health & safety					
Displacement/relocation concerns					
Trust in political & social institutions					
Residential stability					
Density of acquaintanceships					
Attitudes toward proposed action					
Family & friendship networks					
Concerns about social well-being					
Community resources					
Change in community infrastructure					
Indigenous populations					
Changing land use patterns					
Effects on cultural, historical, sacred & archaeological resources					

Note: [a] These variables are suggestive and illustrative and are intended to provide a beginning point for the social assessor. Taylor *et al* (1995) (and the US Forest Service Manual and Handbook (1982)) use the categories of: population change; life style; attitudes, beliefs and values; and social organization. Burdge (1999) uses population impacts; community and institutional arrangements; communities in transition; individual and family-level impacts; and community infrastructure needs. Branch et al (1984) use the categories of social impact assessment variables in their social organization model: direct project inputs; community resources; community social organization; and indicators of individual and family well-being. The US Bureau of Reclamation (BOR) (2002) uses the seven categories of population; community composition; community infrastructure needs; community attitudes and institutional structure; community identity and attitudes toward water; individuals and families; and social justice and Native American responsibilities.

sequential, but often overlap in practice. This sequence is patterned after the EIA steps as listed in the 1986 *CEQ Guidelines*. The corresponding NEPA steps are included within Figure 4.

Public involvement

This means developing an effective public involvement plan to involve all potentially affected public groups. It requires identifying and working with all potentially affected individuals and groups starting at the very beginning of planning for the proposed action and alternatives. Groups affected by proposed actions include: those who live nearby; those who will hear, smell or see a development; those who are forced to relocate because of a project; and those who have an interest in the proposal but may not live in proximity.

Others affected include those who might normally use the land on which the project is located (such as farmers who have to plow around a transmission line). Also there are those affected by the influx of seasonal residents because they may have to pay higher prices for food or rent,

Table 2. Social impact assessment variables, by policy/project setting (type) and stage in SIA process

Policy/ project settings	Stage in SIA process				
	General planning, policy develop preliminary assessment	Detailed planning funding & impact assessment	Construct/ implement	Operation/ maintenance	Decommission/ abandonment
Hazardous waste site	Inter-organization cooperation	Perceptions of risk, health & safety	Influx of temporary workers	Trust in political/social institutions	Alteration in size of local government
Highway project	Formation of attitudes toward the project	Displacement & relocation concerns	Residential stability	Perceptions of risk, health & safety	Community infrastructure
Forest Service to Park Service Management	Attitude toward proposed action	Interested & affected parties	Trust in political & social institutions	Influx of recreation users	Re-distribution of power authority

or pay higher taxes to cover the cost of expanded community services.

The practitioner must be aware of literacy levels, language barriers, and cultural differences in preparing the public involvement program. Potentially affected public groups also may be identified through spatially oriented census data, literature review, networking with agency contact lists or referrals from field staff. Once identified, representatives from each interested and affected party should be systematically consulted to determine potential areas of concern/impact and ways each representative might be involved during initial planning and the final decision. A full range of public involvement techniques should be used to collect information about public response to a proposed action. In this first step, the pieces are put in place for a public involvement program which will last through implementation and become the foundation for monitoring. Most agencies will have a public involvement unit for support.

Describe proposed action

This involves describing the proposed action or policy and, if appropriate, reasonable alternatives. During this step, the proposed action is described in enough detail to begin to identify the data requirements needed from the

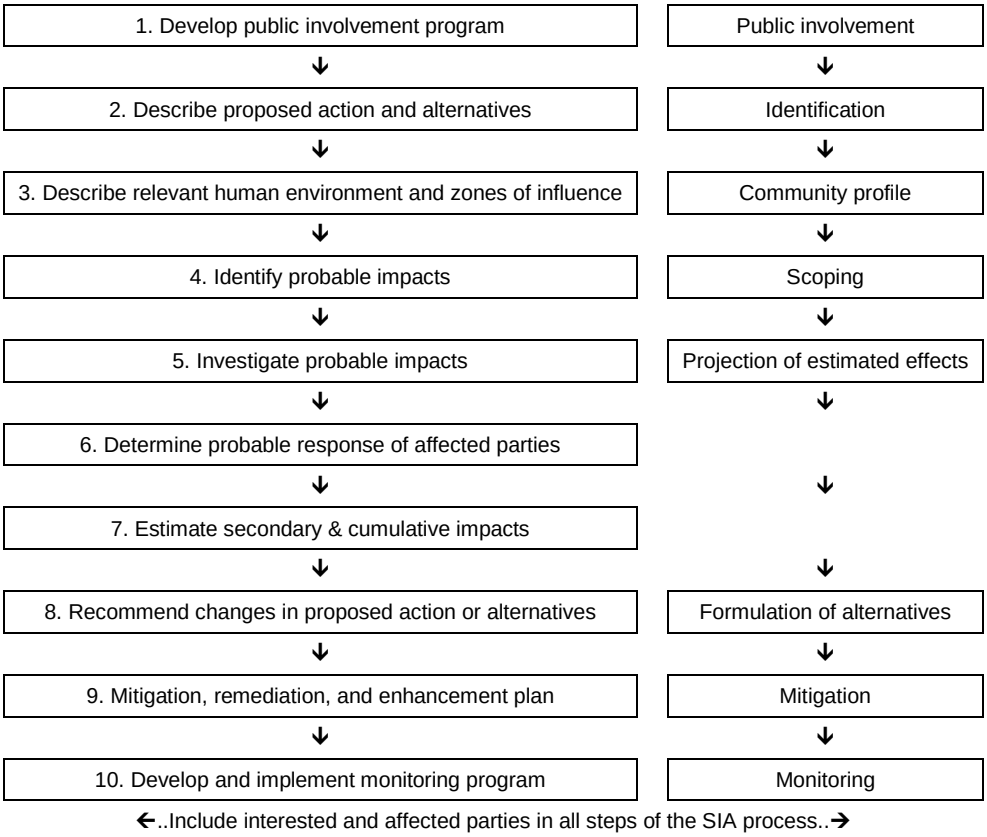

Figure 4. Steps in the social impact assessment process

proponent to do a preliminary assessment. For example, in new road construction, the assessor would need to know location; land requirements; need for ancillary facilities (transmission lines, sewer and water lines); construction schedule; size of the work force (construction and operation, by year or month); facility size/shape; need for local work force; and institutional resources.

The list of social impact assessment variables shown in Table 1 is used as a guide for obtaining data from project proponents. Sometimes the description of the proposed alternatives may not include all the information needed for an SIA. Another problem is the provision of summary numbers when disaggregated numbers are needed. For example, the social assessor may be given numbers for the total peak work force of a construction project, when information is needed on local and non-local commuting workers as well as those hired from outside the area.

Community profiles (baseline study)

This stage involves describing the relevant human environment/zones of influence and baseline conditions. The community profile is the existing conditions and past trends associated with the human environment in which the proposed action is to take place. The terms community profiles and the baseline study are here used interchangeably. Baseline simply means a geographical and time line to start the assessment. For example, with construction projects, a geographical area is identified along with the distribution of special populations at risk; but for policies, plans, programs, or other special assessments (such as, technology, health), the relevant human environment may be a more dispersed collection of interested and affected parties, pressure groups, organizations, and institutions.

The example dimensions for investigation of the human environment listed below apply for construction projects and geographically located programs and policies (the social impact assessment variables listed in Table 1 provide additional guidance for the community profile):

- Relationships with the biophysical environment, including: ecological setting; aspects of the environment seen as resources/problems; areas having economic, recreational, esthetic and/or symbolic significance to indigenous populations; residential arrangements and living patterns, including relationships among communities/social organizations; and if available, attitudes toward environmental and patterns of natural resource use.
- Historical background, including: initial settlement and subsequent shifts in population; key developmental events and eras, including experience with boom–bust effects and a discussion of broader employment trends; past or ongoing community controversies, particularly those involving technology and/or the environment; and other experiences likely to affect the level or distribution of the impacts of, and/or local receptivity to, the proposed action.
- Political and social resources, includes: who has the authority and resources to address issues and problems; the capacities of relevant systems or institutions (for instance, the school system); friendship networks and patterns of cleavage or cooperation among potentially affected groups; levels of residential stability; distributions of socio-demographic characteristics such as age and ethnicity; presence of distinctive or potentially vulnerable groups (for instance, low income); and linkages among geopolitical units (federal, state, county, local and inter-local).
- Culture, attitudes and social-psychological conditions, including: attitudes toward the proposed action; trust in political and social institutions; perceptions of risks; relevant psychological coping and adjustment capacity; cultural cognition of society and environment; assessed quality of life; and important values that may be relevant to, or affected by, the proposed action.
- Economic and financial background (to the extent not listed in other parts of the community profile) include: historical numbers of persons employed by financial sectors and type of firm; payroll size and the amounts of business and sales receipts and taxes by sector and type of firm.
- Population characteristics including: the demographics of relevant groups (including all significant stakeholders and underrepresented and disadvantaged populations and groups); major industrial and agricultural activities; the labor markets to include available labor by occupational category by race and nation origin; unemployment and underemployment numbers; present population and expected changes; availability of housing, infrastructure and services; size, gender and age structure of households; and seasonal migration patterns to include both leisure and labor migrants.

The level of effort devoted to the description of the human environment should be commensurate with the size, cost and degree of expected impacts of the proposed action. At a minimum, the existing literature on comparable or analogous impact events, key local informants and readily available documents such as government reports should be consulted. On-site investigations are a must. If available, always use the findings from previous field studies, general surveys, rapid appraisals and mini-surveys.

Scoping

After obtaining a technical understanding of the proposed action, identify the full range of probable social impacts that will be addressed based on discussion/interviews with sponsoring agency and potentially affected populations. During initial scoping, the SIA practitioner selects the SIA variables for further assessment situations. Consideration needs to be devoted to both the impacts perceived by the sponsoring agency and those perceived by

After obtaining a technical understanding of the proposed action, identify the full range of probable social impacts that will be addressed based on discussion/interviews with sponsoring agency and potentially affected populations

interested and affected publics and key stakeholders. At this point in the process, available methods are reviews of the existing social science literature and public scoping based on appropriate public participation techniques. Ideally, all affected publics contribute to the selection of SIA variables for assessment, either through a participatory process or by review and comment on the decisions made by responsible officials and the interdisciplinary SIA–EIA team.

Relevant criteria for selecting 'significant' social impacts comparable to those spelled out in the CEQ (1986) Regulations (40 CFR 1508.27), include the:

- probability of the event occurring;
- number of people and/or indigenous populations that will be affected;
- duration of impact (long term vs short term);
- value of benefits and/or costs (benefits and burdens) to impacted groups (intensity of impacts);
- extent to which identified social impacts are reversible or can be mitigated;
- likelihood that an identified impact will lead to secondary or cumulative impacts;
- relevance for present and future policy decisions;
- uncertainty over possible effects;
- presence or absence of controversy over the issue.

Investigate probable impacts

This involves investigating the probable social impacts, which will be formulated in terms of predicted conditions without the actions (baseline condition), the predicted conditions with the actions and the predicted impacts, which can be interpreted as the differences between the future with and without the proposed action. The empirical procedure is based on the social impact assessment model outlined (see Figure 2).

Investigation of the probable impacts involves five major sources of information: detailed data from the sponsoring agency on the proposed action; record of previous experience with similar actions as represented in reference literature to include other EIAs–SIAs; census and vital statistics; documents and secondary sources; and field research, including informant interviews, hearings, group meetings and, if funds are available, surveys of the general population. Population 'pockets' within the area need to be over-sampled if there is reason to believe there will be disproportionate impacts. The investigation of the social impacts identified during scoping is the most important component.

Methods of projecting the future lie at the heart of the SIA process and much of the process of analysis is tied up in this endeavor. Care must be taken to ensure the quality and transparency of methods and data and to provide for critical review (compare with Data Quality Act, 2001). Most of the methods to analyze social impacts fall into the following categories:

- Comparative method: The SIA model (Figure 2) uses the comparative research approach. The present is compared to the future with the proposed action. Based on past research and experiences in similar cases, determination of significance is made based on the comparative data presented.
- Straight-line trend projections means taking an existing trend and simply projecting the same rate of change into the future; we assume that what happened in the past is likely to happen in the future. For example, recreation visitations increase each year at about the same rate they did in the past.
- Population multiplier methods means each specified increase in population implies designated multiples of other variables, such as jobs, housing units and other infrastructure needs.
- Statistical significance means calculations to determine probabilistic differences between with and without the proposed action. A social assessor could employ comparative statistical methods to determine statistical significance for appropriate SIA variables.
- Scenarios refers to logical-imaginations based on construction of hypothetical futures through a process of mentally modeling the assumptions about the SIA variables in question.
- Expert judgment: persons familiar with the study area could be asked to present scenarios and assess the significant implications for the proposed action.
- Calculation of 'futures forgone': a number of methods have been formulated to determine what options would be given up irrevocably as a result of a plan or project, for instance, river recreation and agricultural land use after the building of a dam. The wetlands mitigation strategy is such an example.

The record of previous experience is very important to the estimation of future impacts. It is largely contained in case reports and studies and the experience of other assessors. Variations in the patterns of impacts and responses in these cases also should be registered. Expert knowledge is used to enlarge this knowledge base and to judge how the proposed action is likely to deviate from typical patterns. The documents and secondary sources provide information on existing conditions, plans, reported attitudes and opinions, and contribute to the present assessment. The field research involves interviews with persons who have different interests at stake, different perspectives, and different kinds of expertise.

Wherever feasible, it should also involve a search through a wide range of documentation that is often available in forms ranging from official statistics to the minutes of organizations, the meetings and letters to the editor. The opinions of the various publics toward the proposed action should also be part of the record. If time and funding permits, surveys of the general population are valuable to assess public opinion, because spokespersons do not always represent the views of the rank and file. Public meetings should be used to identify possible impacts but not to collect data for projections.

Determine responses to impacts

This step involves determining the significance of the identified social impacts. Projecting is both a very important and a very difficult assessment task, but the responses of affected parties frequently will have significant higher-order impacts. After the direct impacts have been estimated, the assessor must next estimate how the affected publics will respond in attitude and actions. Their attitudes before implementation predict their attitudes afterwards, though there is increasing data that show fears are often overblown and that expected (often promised) benefits fail to meet expectations.

The actions of affected publics are to be estimated

using comparable cases and interviews with those affected about what they expect to do. So much depends on whether local leadership arises and the objectives and strategies of these leaders, that this assessment step often is highly uncertain, but at least policy makers will be notified of potential problems and unexpected results.

This step is also important because adoption and responses of affected publics can have consequences of their own, whether for an agency that proposes an action (as when political protest stalls a proposal) or for the affected communities, whether in the short term or in the longer term (as in the previously noted example of Morgan City, Louisiana).

Patterns in previous assessments guide this analysis, and expert judgment and field investigations are used to determine whether the study case is following the typical patterns or how it is developing uniquely. Being able to show both the proponent and potentially affected publics that significant impacts are being incorporated into the assessment is critical to the success of this step.

Secondary and cumulative impacts

This involves estimating subsequent impacts and cumulative impacts. Secondary or indirect impacts are those caused by the primary or direct impacts; they often occur later both in time and geographic distance than primary impacts. Cumulative impacts are those resulting from the incremental impacts of an action added to other past, present, and reasonably foreseeable future actions regardless of which agency or person undertakes them (see CEQ, 1986, 40 CFR 1508.7)

A community's residential and retail growth and pressures on government services following the siting of a highway interchange are examples of secondary impacts. Cumulative impacts would be the sum of the proposed action plus past and present activity in the same area. While they are more difficult to estimate precisely than primary impacts, it is very important that secondary and cumulative impacts be clearly identified in the SIA.

Alternatives to the proposed action

This involves recommending new or changed alternatives and estimate or project their consequences. Each alternative or recommended change in the proposed action should be assessed separately. The methods used in step five (estimation) apply here but usually on a more modest scale. More innovative alternatives and changes probably should be presented on an experimental basis. Expert judgment and scenarios are helpful in developing alternatives or variations. The number of iterations here will depend upon time, funding and the magnitude of the proposed action.

Mitigation

A social impact assessment not only forecasts impacts, it should identify means to mitigate adverse impacts. Mitigation includes avoiding the impact by not taking or modifying an action; minimizing, rectifying, or reducing the impacts through redesign or operation of the project or policy; or compensating for irreversible impacts by providing substitute policies, facilities, resources, or opportunities (see CEQ, 1986, 40 CFR 1508.20).

Ideally, mitigation measures are built into the selected alternative, but it is appropriate to identify mitigation measures even if they are not immediately adopted or if they would be the responsibility of another organization or government unit. (Federal legislation that mandates mitigation measures may be found at <www. nmfs.noaa. gov/sfa/reports.htm>.)

By articulating the impacts that will occur and making efforts to avoid or minimize the adverse consequences, or compensating the residents or the community for the losses, benefits may be enhanced and avoidable conflicts can be managed or minimized

We suggest a sequencing strategy to manage social impacts modeled after one used with wetland protection and other natural resource issues. During the first sequence, the wetlands managers strive to avoid all adverse impacts if possible. In the second sequence, managers strive to minimize any adverse impacts that cannot be avoided. During the third sequence, managers compensate for adverse impacts. Compensation for the loss of a wetland, for example, could be to acquire a different wetland, enhance a degraded site, or create a new wetland. The amount of compensation can be based on the type of wetland or resources damaged/lost, the severity of the impact and location of the wetland mitigation site.

The first two steps of sequencing — avoiding and minimizing — can apply to the project itself or to the host community or the impacted region. For example, the project may be revised to avoid or minimize adverse social impacts (for instance, by extending the construction period to minimize in-migration), or the community may be able to take steps to attenuate, if not avoid, any adverse effects. Application of the sequencing concept for the mitigation of adverse social impacts requires that the assessor first rank the level of importance of each significant SIA variable determined during the estimated effects SIA step.

The first step in evaluating potential mitigation for each social impact variable is to determine whether the proponent or sponsoring agency could modify the proposed action to avoid adverse social impacts. For example, a road that displaces families could be re-routed.

Next is to identify ways to minimize adverse social impacts. For example, most citizens are uncomfortable with the idea of locating a waste facility or prison near their community. Attitudes (particularly negative ones) formed about an undesirable land use, cannot be eliminated, but might be moderated if the public has complete information about the proposal and is included in the decision-making process or is provided with sufficient legal and structural arrangements that assure safe operation.

There are at least three benefits of identifying irresolvable social impacts that may result from a proposed action. The first is identifying methods of compensating individuals and the community for unavoidable impacts. The second occurs when the community may identify

ways of enhancing other quality of life variables as compensation for adverse effects. The third happens when the identification of the irresolvable social impacts makes community leaders and project proponents more sensitive to the feelings of community residents. By articulating the impacts that will occur and making efforts to avoid or minimize the adverse consequences, or compensating the residents or the community for the losses, benefits may be enhanced and avoidable conflicts can be managed or minimized.

Monitoring

A monitoring program must be developed that is capable of identifying both deviations from the proposed action and unanticipated social impacts (Magnuson-Stevens Act [compare with §302(g) and §302 (h)]). Furthermore, the monitoring plan should track project/program development and compare real impacts with projected impacts, and should spell out the nature and extent of additional steps to be taken when unanticipated impacts or impacts larger than the projections occur.

Monitoring programs are necessary for projects and programs that lack detailed information or have high variability or uncertainty. It is important to recognize, in advance, the potential for 'surprises' that may lie completely outside the range of options considered during the assessment process. If monitoring procedures cannot be adequately implemented then mitigation agreements should work to the benefit of all parties involved in a decision-making process and should allow an approved action to move forward.

It is generally only at this stage that the community or affected groups have the influence to 'get it in writing.' For example, a monitoring program, with subsequent provision for mitigation, was negotiated between the US Department of Energy and the State of Texas to build the Super Conducting Super Collator Laboratory. The process allowed for the payment of approximately US$800,000 to local jurisdictions to monitor the impacts of the construction activity.

Conclusion

Social impact assessment is predicated on the notion that decision makers should understand the consequences of their decisions before they act and that the people affected will not only be apprised of the effects, but have the opportunity to participate in designing their future. The social environment is different than the biophysical environment because it reacts in anticipation of change, but can adapt in reasoned ways to changing circumstances if it is a participant in the planning process. In addition, persons in different social settings interpret social change in different ways and react in different ways.

Perhaps because of this complexity, or the political consequences of making explicit the social consequences of policies, plans, programs and projects, social impact assessment has not been well integrated into US federal agency decision making. The principles and guidelines presented herein are designed to assist agencies and other institutions in implementing SIA within the context of the NEPA process. If a well-prepared SIA is integrated into the decision-making process, better decisions will result.

Notes

1. *Members of the original team. For more administrative details contact Rabel J Burdge at burdge@cc.wwu.edu or go to <www.nmfs.gov/sfa/reports.htm>.

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