Chapter II
Concept of Environmental Impact Assessment during Project Implementation

The environmental impact assessment is a system designed so that before implementing a project, the project proponents give appropriate consideration to environmental conservation by requiring the proponents themselves to survey, forecast and evaluate the kind of impact the project will have on the environment, publicly release the findings, and after obtaining feedback from the general public, local governments and other interested parties, have that feedback reflected in environmental measures and project plans.

The Environmental Impact Assessment Act prescribes procedures for the appropriate and efficient implementation of the environmental impact assessment during the project planning stage and implementation stage.

Adopting efficient environmental mitigation measures to prevent or reduce environmental impact can be difficult during the project implementation stage, so the procedures during the planning stage (consideration document procedures)* is to set multiple proposals concerning the project site, scale, layout and structure early in the project planning stage, and conduct comparative examinations with the aim of preventing or reducing serious environmental impact.

The procedures at the project implementation stage (procedures for scoping document, draft environmental impact statement, and environmental impact statement) is to select, survey, forecast and evaluate environmental impact assessment items in light of the project and local characteristics based on a more specific project plan reached through the examination under the planning stage procedures, and also examine concrete environmental mitigation measures to prevent or reduce the environmental impact for each selected environmental impact assessment item.

Therefore, examinations into preventing or reducing serious environmental impact at the planning stage and into environmental mitigation measures stemming from the environmental impact assessment in the subsequent project implementation stage should be in accordance with the maturity of the project plan at each stage, and should be conducted in light of the series of environmental conservation considerations during project planning.

The aim of the environmental impact assessment will ultimately be achieved when there is confirmation that the environmental mitigation measures examined through the series of procedures have produced the envisaged outcome.

Reference: Environmental impact assessment documents (assessment documents)

Environmental impact assessment documents (assessment documents) are prepared by the project proponent in the environmental impact assessment procedure. Assessment documents prescribed under the Environmental Impact Assessment Act are a document on primary environment impact consideration scoping document, draft statement, impact statement, and impact mitigation report. The procedure under local government ordinances concerning environmental impact assessment is generally as follows, however the designations used may vary among ordinances, and the preparation of review reports on comments and opinions may also be required.

■ Document on primary environmental impact consideration at the early stage (consideration document): Document prepared in the planning stage for project site and scale etc. that presents the results of the review into those matters that should be considered for environmental conservation. The following are the main items for inclusion.

- Name and address of the person who intends to implement Category 1 project.
- the purpose and contents of the Category 1 project.
- he general conditions of the area for possible implementation of the project and its surrounding area.
- a summary of the results of survey, forecast and evaluation for each items for Primary Environmental Impact Consideration at the early stage.

■ Document on environmental impact assessment method (scoping document): Document that presents the method in which the environmental impact assessment will be conducted. The following are the main items for inclusion.

- Name and a location of the project proponent.
- Purpose and contents of the target project.
- The general conditions of the target project implementation area and the surrounding area.
- the methods for survey, forecast and evaluation, relating to the items for primary environmental impact consideration at the early stage.

(In addition to the above for projects that have conducted the consideration document procedures)

- Results of the survey, forecast and evaluation for each consideration item in the planning stage.
- Opinion of the competent minister about the consideration document from the standpoint of the environmental conservation and the views of the project proponent.
- When the opinions of the relevant administrative agencies or the general public regarding the draft consideration document or the consideration document is required, a summary of those opinions and the views of the person who intends to implement the Category 1 project proponent.
- Progress and details of examinations relating to environmental conservation considerations carried out in the course of deciding on the potential project area and other relevant items.

■ Draft environmental impact statement (draft statement): Document that presents the results of the environmental impact assessment. The following are the main items for inclusion.

- Name and location of the project proponent.
- Purpose and contents of the target project.
- The general conditions of the project area and the surrounding area.
- Summary of public opinion about the scoping document from an environmental conservation perspective and the views of the project proponent.
- Opinions expressed by the prefectural governor and other officials about the scoping document from an environmental conservation and the views of the project proponent.
- Environmental impact assessment items, and the survey, forecast and evaluation methods.
- Result of the environmental impact assessment (environmental mitigation measures and the conditions of the examination leading to the adoption of those measures).

(In addition to the above for projects that have conducted the consideration procedures)

- Results of the survey, forecast and evaluation for each consideration item in the planning stage.
- Opinion of the competent minister about the consideration document from the standpoint of environmental conservation and the views of the project proponent.
- When the opinions of the relevant administrative agencies or the general public regarding the draft consideration document or the consideration document are required, a summary of those opinions and the views of the Category 1 project proponent.
- Progress and details of examinations relating to environmental conservation considerations carried out in the course of deciding on the potential project area and other relevant items.

■ Environmental impact statement (impact statement): Document that contains the necessary amendments to the draft statement based on the various opinions submitted or expressed. The following are the main items for inclusion.

- Content of the draft statement amended as necessary.
- Summary of public opinions submitted about the draft statement from the standpoint of environmental conservation and the views of the project proponent.
- Opinions expressed by the prefectural governor and other officials about the draft statement from an environmental conservation perspective and the views of the project proponent.

■ Report on environmental mitigation measures (impact mitigation report): Document that presents the state of implementation of environmental mitigation measures. The following are the main items for inclusion.

- Name and address of the project proponent.
- Basic information about the project, including name, type and scale of the project, and the area where the project was implemented.
- Follow-up survey items, methods and results.
- Details, outcomes, and level of uncertainty regarding the environmental mitigation measures.
- If expert advice was received, details of that advice.
- Statement to the effect that if surveys or environmental mitigation measures are to be conducted after the impact mitigation report has been prepared, such plans and results will be publicly released.

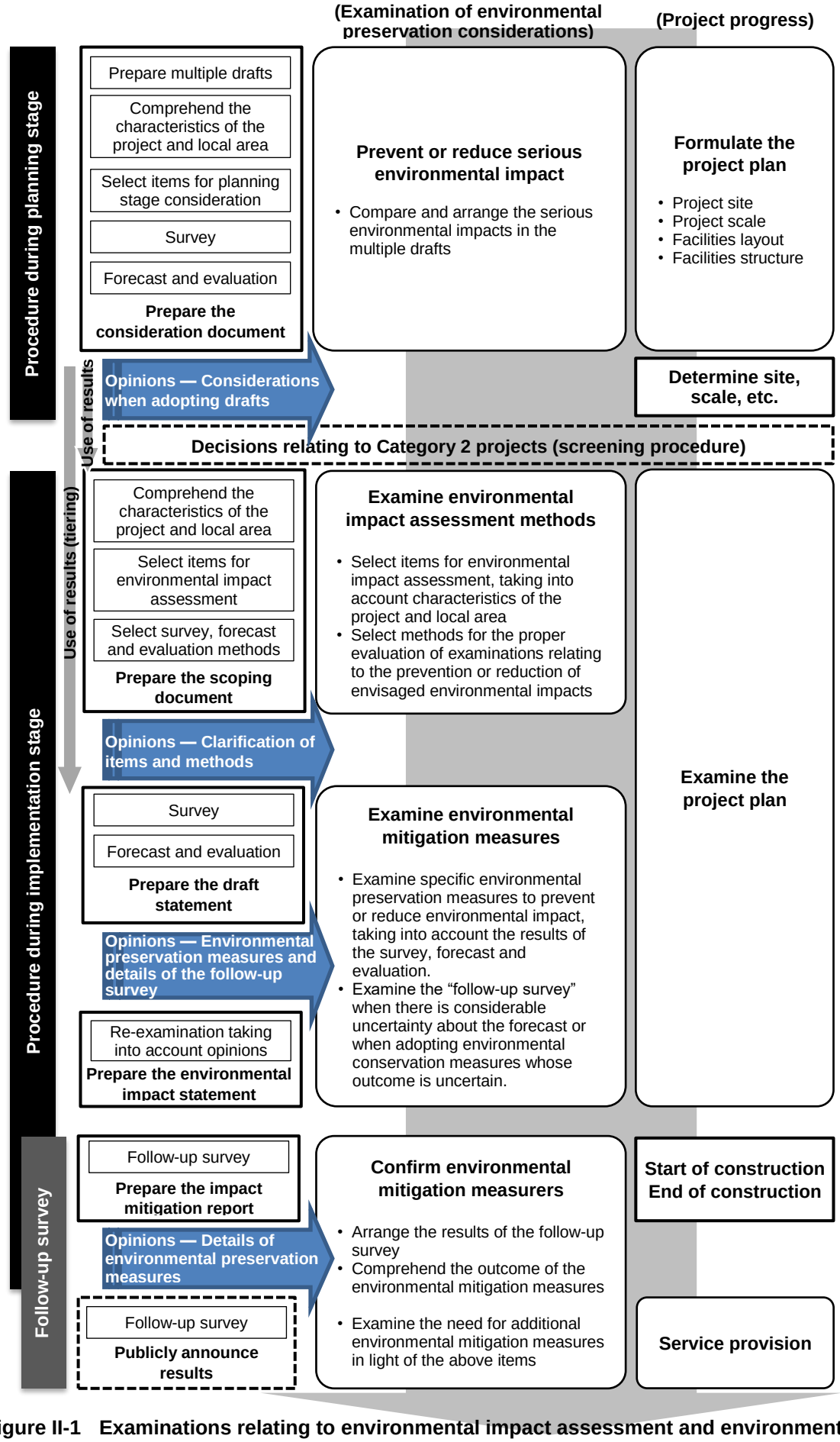


Figure II-1 Examinations relating to environmental impact assessment and environmental conservation considerations

Note: Procedures under the Act that are implemented on an as required basis are shown enclosed in a dashed line.

1. Use of results of planning stage procedures (consideration document procedures)

1.1 Concept of use

Results and opinions obtained from the planning stage consideration document procedures are used for or reflected in the efficient and rational execution of the environmental impact assessment in the project implementation stage (tiering). Results etc. of the consideration document procedures can be used primarily in the following.

Note: Tiering here refers to using or reflecting the examination results of the preceding stage in the environmental impact assessment.

1.1.1 Use in project plan explanations

When the opinions of the relevant administrative agencies or the general public are required in the planning stage consideration document procedures, the process and details of the examination relating to environmental conservation considerations during the process of deciding on the project area are to be recorded in the scoping document, so the examination process in the planning stage consideration document procedures can be used in explaining the process of deciding on the project plan in the scoping document.

- Assuming that the project plan in the scoping document will have undergone a socioeconomic examination after the consideration document was drawn up, there are times when environmentally the best draft examined in the consideration document procedures is not always adopted, and times when the project plan adopted is different from all of the multiple drafts in the consideration document. Therefore, the project plan examination process subsequent to the consideration document procedures must also be recorded.

1.1.2 Selection of environmental impact assessment items and use in selection of survey, forecast and evaluation methods

Survey, forecast and evaluation results for the planning stage consideration items in the consideration document can be used in the selection of environmental impact assessment items and survey, forecast and evaluation methods.

- When a project plan that prevents or reduces serious environmental impact on, for example, important species etc. was selected from among the multiple drafts in the consideration document, adopting definitive and simple survey or forecast methods that can comprehend environmental impacts other than that serious impact can be expected to improve efficiency in the project implementation stage procedures.
- It is preferable to link planning stage consideration items that are forecast to have a serious environmental impact and those judged to have considerable uncertainty to the selection

of clear environmental impact assessment items or survey, forecast and evaluation methods, including focusing on survey and forecast methods in the project implementation stage.

1.1.3 Use of survey data

Existing material and other survey results collected and compiled during consideration document procedures can be used in the survey of procedures in the project implementation stage.

- Information on the regional environment gathered and compiled in the consideration document can be used for recording the regional overview in the project implementation stage procedures to improve work efficiency.
- Use of survey results obtained during consideration document procedures in the survey of project implementation stage procedures can be expected to make the survey, forecast and evaluation in the project implementation stage more extensive and efficient. However, it should be kept in mind when using survey results that the survey scope may vary between the planning stage and the project implementation stage depending on the environmental impact assessment item.
- Existing material regarding, for example, scenery or areas of nature-related activities that was collected and compiled in the consideration document procedures, and the local characteristics and the concept of setting the survey scope examined based on this material can also be used in the project implementation stage. By updating the details with the latest material as necessary and reviewing the survey scope in the light of such material not collected and compiled in the consideration document procedures can make the survey in the project implementation stage procedures more comprehensive.

1.1.4 Use of forecast results

Forecast results from the consideration document procedures can be used in forecasts in project implementation stage procedures.

- When relatively detailed forecasts are conducted in the consideration document procedures, those forecast conditions can be carried over or updated and used in forecasts in the project implementation stage. This can be expected to have the effect of making the survey, forecast and evaluation in the project implementation stage more comprehensive and efficient.
- If the project plan in the planning stage is quite mature, forecast results similar to those that would be presented in the project implementation stage could be presented in the consideration document through the conduct of a field survey (scenery, areas of nature-related activities, etc.). In this case, forecast results in the consideration document procedures can be used in the project implementation stage procedures, so there is no need to conduct another survey or forecast in the project implementation stage procedures unless

it is considered particularly necessary (when serious environmental impact is forecast, or when there is a significant change to the project plan).

1.1.5 Use in explaining prevention or reduction of environmental impact

In the examination of environmental mitigation measures in the project implementation stage procedures, there is a need to specify the environmental impact prevention or reduction effect through examination of the multiple drafts from the consideration document procedures, and also present the environmental impact prevention or reduction effect through examination of the series of project plans.

2. Selection of environmental impact assessment items and survey, forecast and evaluation methods

2.1 Concept of comprehending project and local characteristics

The purpose of comprehending the details of the project (project characteristics) and natural and social conditions in the project area and the surrounding area (local characteristics) is to gain the necessary information for clarifying project plans and their social standing, and characteristics relating to natural and social conditions in the region, and selecting environmental impact assessment items and survey, forecast and evaluation methods. Comprehending project and local characteristics must therefore be comprehensive and exhaustive, regardless of whether they are selected as environmental impact assessment items.

- When selecting environmental impact assessment items, it is necessary to explain why those items were selected, so these characteristics must be comprehended to a level that would facilitate this explanation.
- Information on project or local characteristics was obtained and compiled to a degree in the consideration document procedures, so provided the information is sufficient to allow a decision on not selecting characteristics as environmental impact assessment items, there is no need to obtain any more information on project or local characteristic relating to those items. Where additional information is collected after the consideration document procedures, this information must also be included.
- Project and local characteristics needed for the selection of environmental impact assessment items and selection of survey, forecast and evaluation methods differ according to the environmental impact assessment items, so information on these characteristics must be broad-ranging, and when recording this information in the scoping document etc., where necessary, wide-area maps and information on past changes in natural and social conditions and projected future conditions should also be included to facilitate an comprehending of the overall image of the project and local characteristics.

2.1.1 Comprehending project characteristics

Comprehending project characteristics is to compile actions that cause an impact on the environment during project implementation (impact factors).

- Information about project characteristics that must be comprehended is specified in ordinance of the competent ministry for each project type subject to the Law. In general, information on items such as those listed below is collected and compiled. While collecting and arranging detailed information, especially that concerning the implementation of construction work, may be difficult when selecting environmental impact assessment items or survey, forecast and evaluation methods before details of the project plan have been established, in these cases probable project characteristics can be comprehended by referring to similar project cases.
  - Project type
  - Location of the project area
  - Project scale
  - Summary of the project service plans
  - Summary of the project construction plan
  - Other matters concerning the project

- Comprehending project characteristics also includes arranging the background to and details of examinations relating to environmental conservation considerations in the process of finalizing the project framework. Clarifying the background to examinations regarding environmental conservation considerations can help to deepen the comprehending by those reading the scoping document or other persons concerned so they can form more specific and constructive opinions, and also form their opinions on the project plans at an earlier stage.
- Information on project characteristics must be finalized by the time of the draft statement procedures as the project plan becomes more mature, and this information should be reflected in the selection of environmental impact assessment items and survey, forecast and evaluation methods.

2.1.2 Comprehending local characteristics

Local characteristics are comprehended by widely collecting information that is relevant to the selection of environmental impact assessment items and survey, forecast and evaluation methods from the latest publications and other material, as well as conducting surveys on general regional conditions centering on readily available publications and other material. For this, it is important to collect information not just on environmental conditions in the region, but on features/facilities that especially require consideration regarding environmental conservation, and the state of designated areas and restrictions based on local government regulations and government laws and ordinances.

1) Area

The extent of the area of local characteristics to be comprehended must include the survey area for environmental impact assessment items, and be broad enough to enable the selection of environmental impact assessment items and survey, forecast and evaluation methods in view of the impact factors compiled as project characteristics.

- When the consideration document procedures have been implemented, using regional environmental information collected and compiled for the consideration document to record a regional overview and other information in the scoping document can improve work efficiency.
- The survey area for environmental impact assessment items is stipulated in the Basic Matters as "the area that includes areas where environmental conditions will change beyond a certain level, or the area where the environment will be altered directly and its surrounding area as a result of the implementation of the project". The areas where environmental conditions will change beyond a certain level will vary for each environmental impact assessment item. The "change beyond a certain level" that will have an effect human health or the living and natural environment because of the change in environmental conditions will also vary according to the respective environmental impact assessment items.
- Therefore the area of the local characteristics to be comprehended should not be decided upon uniformly from topographical maps or other charts, distance from the project area, or administrative district, but should be set according to the environmental impact assessment items or elements that make up the local characteristics. In addition to the project area, full consideration should also be given to water systems, access roads and other traffic lines, and watersheds, topography and other natural conditions.
- Flexibility is essential when setting local characteristics to be comprehended. Once the various elements of the local characteristics have been identified, it is important to carry out an extensive survey in areas where environmental conditions will change significantly, and in those areas where only minor changes will occur, the survey should focus on features/facilities that are susceptible to environmental impact. Moreover, if there are considered to be features/facilities in the surrounding area that are particularly susceptible to environmental impact, those features/facilities should also be included in the local characteristics to be comprehended.
- If, in the conduct of the survey to comprehend local characteristics, it is thought to be necessary to expand the survey area or judged that it is acceptable to reduce the survey area, the area may be changed as appropriate.

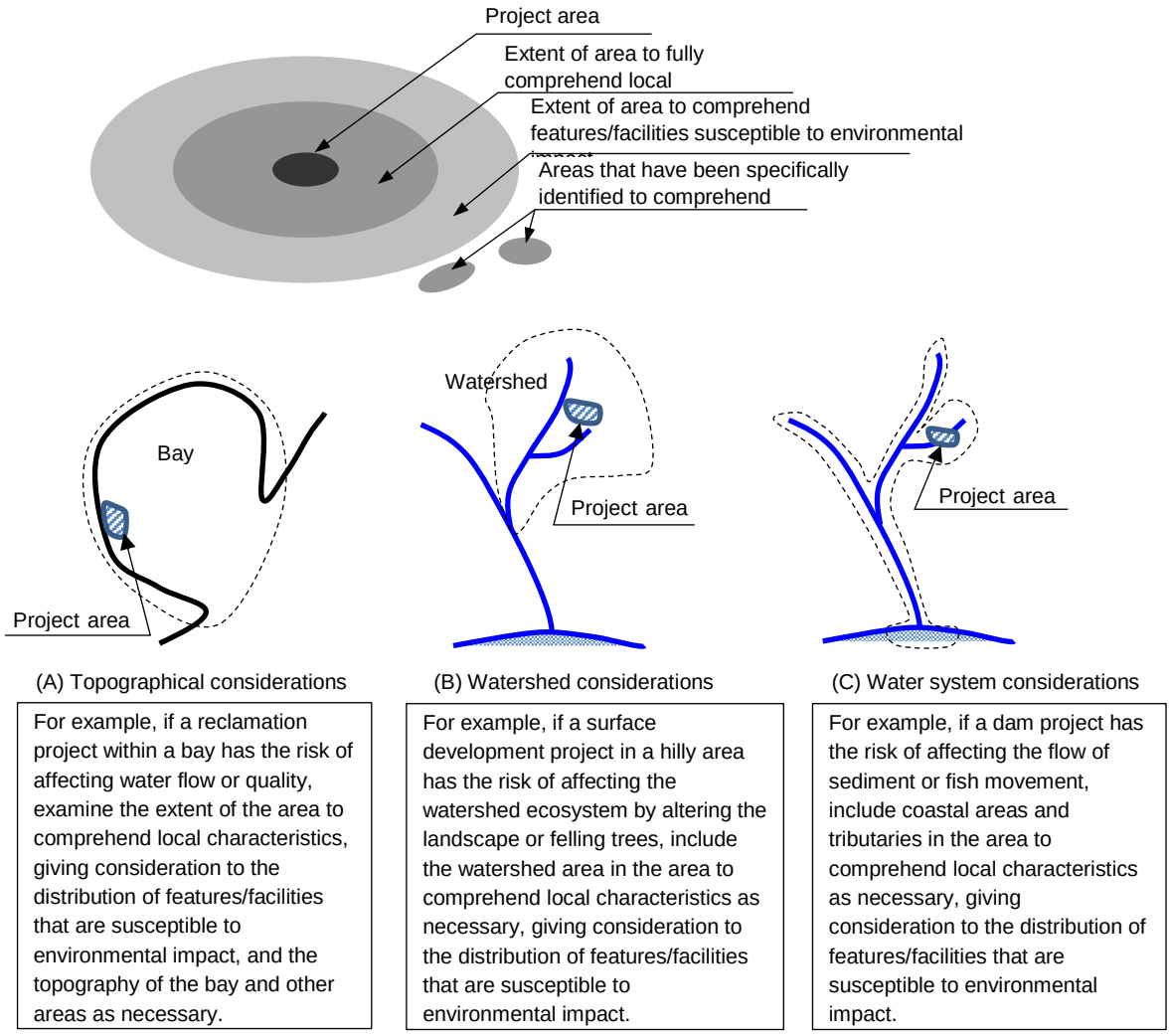


Figure II.2-1 Extent of area to comprehend local characteristics

2) Period

While focus will naturally fall on current conditions when comprehending local characteristics, there is also a need to comprehend past changes in conditions and gather information on likely future conditions considering that the implementation of large-scale projects subject to environmental impact assessment will be in the future, and the environmental impact will continue well after the project commences service.

- When comprehending, for example, the local natural environment, there is a need to study past changes in vegetation and the causes of those changes (e.g., changes in vegetation along a riverbed from human or natural causes) to comprehend the current stage of vegetation transition, and also study how that vegetation transition is likely to proceed in the future.

3) Methods

Local characteristics can be comprehended by collecting and arranging available material (publications, topographical maps, results of past surveys, etc.), discussions and interviews with experts, and field surveys and inspections. In comprehending local characteristics, examples of projects currently being implemented or large-scale projects implemented in the past in the same area are a valuable resource for assessing the impact of the present project, so as much information as possible should be collected about these other projects.

(1) Collecting and arranging existing material

Existing material on environmental conditions and information on population, industry and other basic local characteristics are often consolidated in government documents and publications, so for research using existing material, it is important to first collect and compile material prepared by administrative organizations in the subject area. More detailed information can often be obtained by tracing such material back to the sources or responsible administrative department. As well as administrative organizations, quite often power utilities and authorities managing toll roads and other roads gather long-term monitoring data. When researching existing material, it is essential to collect the latest available material, and clearly cite the sources of that material.

Normally, the following kinds of existing material are available for research into local characteristics.

- Material on current environmental conditions: White Paper on the Environment, Sound Material-Cycle Society and Biodiversity, current environmental conditions in the target region, and various national and local government databases available to the public.
- Information on population, industry, and other basic social characteristics: Prefectural and municipal handbooks, and White Paper on Statistics.
- Material on history and culture: Prefectural and municipal history, etc.

In addition to the above, information on areas and features/facilities that are susceptible to environmental impact, areas and features/facilities that have been designated by laws and ordinances from an environmental conservation perspective, existence of areas where the degree of the environmental impact has caused seriously deterioration or there is a high risk of serious deterioration, and details of environmental mitigation measures adopted by the national and local governments should also be collected and compiled (see Tables II.2-1–II.2-4).

Table II.2-1 Examples of areas and features/facilities susceptible to environmental impact

Classification	Details
Areas where pollutants tend to accumulate	Closed water areas and other areas where pollutants emitted in the implementation of the project tend to accumulate.
Areas where consideration must be given to the protection of human health or conservation of the living environment	Schools, hospitals, residential areas, water supply intake points and other areas or features/facilities that especially require consideration regarding the protection of human health or conservation of the living environment.
Natural environment with virtually no human-induced change, and natural environment that is an important wildlife habitat	Natural forests, marshlands, seaweed beds, tidal wetlands, coral reefs, natural coastlines and other areas of natural environment with virtually no human-induced change or areas of fragile natural environment that cannot readily recover after change.
	Those rural landscapes (secondary forests, plantation forests, farmland, ponds, grasslands, etc.), marshlands in river floodplains, and riparian forests with a natural environment that is decreasing in size or is deteriorating.
	Watershed protection forests, windbreak forests, water purifying tidal wetlands, areas of green that function to prevent landslides, and other areas of natural environment in the region with important functions.
	Those urban woodlands and areas of green (slope forests, shrine and temple forests, homestead forests, etc.) and waterfront areas with an important natural environment that characterizes the region.

(2) Discussions with experts and others

To supplement existing material, discussions should be held with researchers and others who have extensive knowledge about local environmental conditions as necessary.

Experts whose opinions should be sought can include university researchers, high school teachers, museum curators, local government officials (e.g., officials from departments responsible for environmental policy or environmental impact assessment review), private-sector organizations that undertake environmental conservation activities, and local residents.

(3) Field study and exploration

In field study and exploration technicians with a certain degree of survey experience (e.g., environmental impact assessment coordinators, and technicians in a leadership position in workgroups covering each of the environmental components) visit the local area, and confirm the natural and social conditions of the subject area. Here, rather than detailed findings, the focus of the survey should be on gaining an overall image of the local characteristics that is not forthcoming from documents and other publications. When conducting the survey, it is important to always be conscious of identifying features/facilities that are susceptible to environmental impact from the project (e.g., facilities that especially require consideration regarding environmental conservation).

When it is envisaged that environmental impact assessment items will be selected at this stage, the areas or locations that will be subject to survey, forecast and evaluation can be broadly set during the field survey.

If existing material does not provide sufficient information or the available data are extremely old, a field survey can be conducted at this stage to obtain the necessary data for formulating an appropriate environmental impact assessment plan.

Table II.2-2 Examples of facilities considered to be susceptible to environmental impact

Classification	Facilities
Educational facilities	Nursery schools, kindergartens, primary schools, junior high schools, high schools, universities, technical schools, and miscellaneous schools.
Medical facilities	Hospitals, medical clinics with inpatient facilities, and sanatoriums.
Other public facilities	Libraries, children's centers, and welfare facilities.
Parks	Children's parks and playgrounds, and municipal parks.

2.2 Selecting environmental impact assessment items

2.2.1 Compiling impact factors

Impact factors in the project are compiled from the project characteristics.

- Factors in chemical substance emissions, or damage or change to the existing environment are compiled for the implementation of project-related construction works, and post-construction presence and operation of land or facilities.
- When facilities in the project area are to be removed or disposed of as a part of the project, or when facilities are planned to be removed or disposed of as a part of project operations included in the aim of the project, impact factors relating to such removal or disposal must also be compiled.

(Points to note) Comparison with general projects (projects subject to the Act)

In selecting environmental impact assessment items and survey, forecast and evaluation methods for environmental impact assessments based on the Environmental Impact Assessment Act, it is important to first compare the content of general projects specified in ordinance of the competent ministry and the content of individual projects, and comprehend the differences.

Content of general projects specified in ordinance of the competent ministry is that envisaged in the competent minister's setting of reference items or reference methods for each project type, and the project proponent examines items and methods that should be adopted based on the reference items or methods through a comparison between the content of individual projects and that of general projects.

In selecting environmental impact assessment items, the reference items should be merely a guide, and it is important that the examination focuses on the project characteristics of the individual projects and local characteristics. Regardless of whether the reference items are adopted or not, the reasons for selecting the environmental impact assessment items must be clearly specified in the scoping document.

2.2.2 Compiling environmental components

Elements of the environment that are at risk of being affected by changes in the environment are compiled from the local characteristics of the project area and the surrounding area.

- At this stage, there is no need to examine the relationship between impact factors and environmental components in detail, but there is a need to examine the environmental components with consideration to the impact factors to ensure there is no possibility of a situation in which environmental components totally unrelated to the impact factors are chosen as environmental impact assessment items, or in which despite there being impact factors, relevant environmental components are not selected as environmental impact assessment items.

2.2.3 Selecting environmental impact assessment items

Environmental impact assessment items are selected based on the relationship between impact factors and environmental components.

- The correlation between impact factors and environmental components using a matrix is suitable for gaining a thorough comprehending of the relationship between the two. On the other hand, an impact flow examination is suitable for comprehending the mutual relationship of environmental components, the relationship between impact factors and other factors such as local characteristics, and secondary environmental impacts. To avoid leaving out environmental impacts that cannot be fully expressed in the matrix, an impact-flow type impact association chart can be drawn up to examine the impact factors and environmental components (Figure II.2-2).

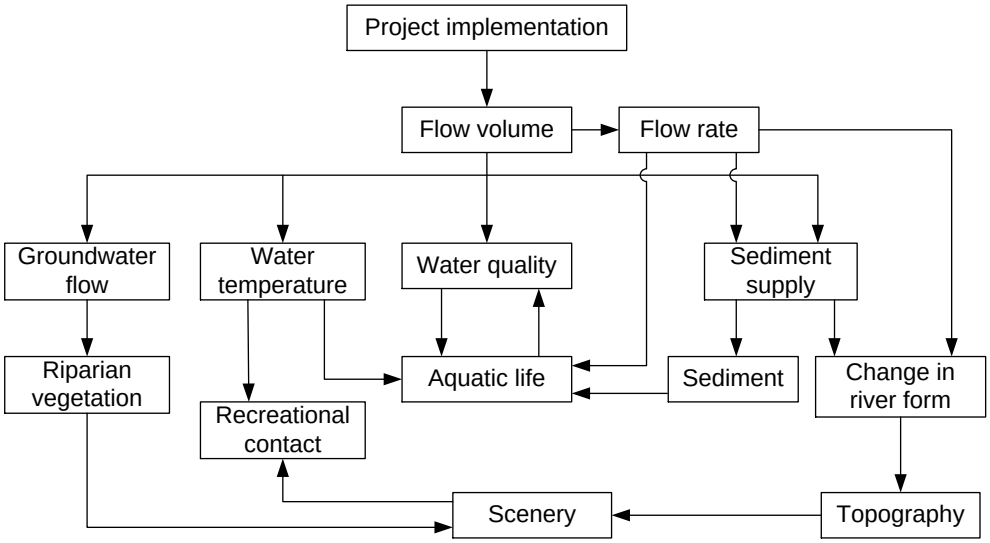


Figure II.2-2 Impact-flow type impact association chart concept

- Environmental components related to the atmospheric environment, water environment, and soil and other environments have a close connection with those related to fauna, flora, ecosystems, and places of recreational contact. Therefore, when selecting environmental impact assessment items relating to the atmospheric environment, water environment, and soil and other environments, and examining survey, forecast and evaluation methods,

consideration must be given to environmental components relating to fauna, flora, ecosystems, and places of recreational contact in the project area and surrounding area.

- On the other hand, information on environmental components relating to fauna, flora, ecosystems, and places of recreational contact collected in connection with environmental components relating to the atmospheric environment, water environment, and soil and other environments is used for selecting these environmental impact assessment items or examining survey, forecast and evaluation methods, so the connection between the various elements and the possible mutual use of the information obtained should be fully examined before starting the survey.
- Moreover, forecast results relating to the atmospheric environment, water environment, and soil and other environments can be used as basic forecasting data for fauna, flora, ecosystems, and places of recreational contact.
- In this way, when selecting environmental impact assessment items and survey, forecast and evaluation methods, full consideration must be given to the mutual relationship between environmental components. This mutual relationship is easily understood if the relationship between environmental components is clearly shown in an impact flow examination.
- Compared to the general project content, if it is clear that there will be no impact or very little impact caused by the project implementation, if it is clear that for a considerable period there will be no areas or features/facilities affected in the project area or surrounding area, and if the extent of the impact is clear from similar project cases, there may be no need to select environmental impact assessment items relating to the environmental components. In this case, it is important to show the information that forms the grounds for this decision in “Project content” or “Regional overview” in the scoping document.

2.3 Selection of survey, forecast and evaluation methods

2.3.1 Concept of examining methods

To carry out effective and rational survey, forecast and evaluation in environmental impact assessments, the aim of the work conducted in each of the environmental impact assessment processes must always be clearly defined. Survey and forecast are for the purpose of conducting the evaluation, so in examining the survey, forecast and evaluation methods, the reverse flow of work from that in the actual environmental impact assessment needs to be adopted; that is, as shown in Figure II.2-3, the sequence of examination of evaluation method → examination of forecast method → examination of survey method.

- If the relationship between survey, forecast and evaluation is not fully examined, unnecessary surveys could be conducted, or additional surveys may be necessary because of deficiencies in initial surveys.
- Similar to the selection of environmental impact assessment items, the selection of survey, forecast and evaluation methods must be examined in the light of characteristics of the individual projects and local characteristics.

(Points to note) When referring to survey, forecast and evaluation methods in similar project cases

When referring to survey, forecast and evaluation methods used in similar project cases in nearby areas, it is appropriate to refer to the final environmental impact assessment document drawn up in the project implementation stage (impact statement). It must be noted that there is a possibility that the survey, forecast and evaluation methods recorded in the scoping document or draft statement may have been altered as a result of subsequent asking opinions and the like before the actual project implementation.

(Points to note) Recording reasons for selecting survey, forecast and evaluation methods

It is preferable to give a clear description of the reasons for selecting the survey, forecast and evaluation methods, and the process by which the methods were examined.

- Example of insufficient detail

  "The forecast method using diffusion simulation will be adopted."
- Preferred example

  "The project area is located in a valley, and considering past air pollution conditions, concentrations of air pollutants tend to rise particularly during winter in February due to the effect of the inversion layer. The air pollutant emission rate caused by the project and the characteristics of the pollutants are XX. From conditions in the surrounding area and the project characteristics, the forecast method using the XX model with XX features will be adopted, and for XX, to which this model cannot be applied, the forecast method using the XX model, which is suited to this condition, will also be adopted."

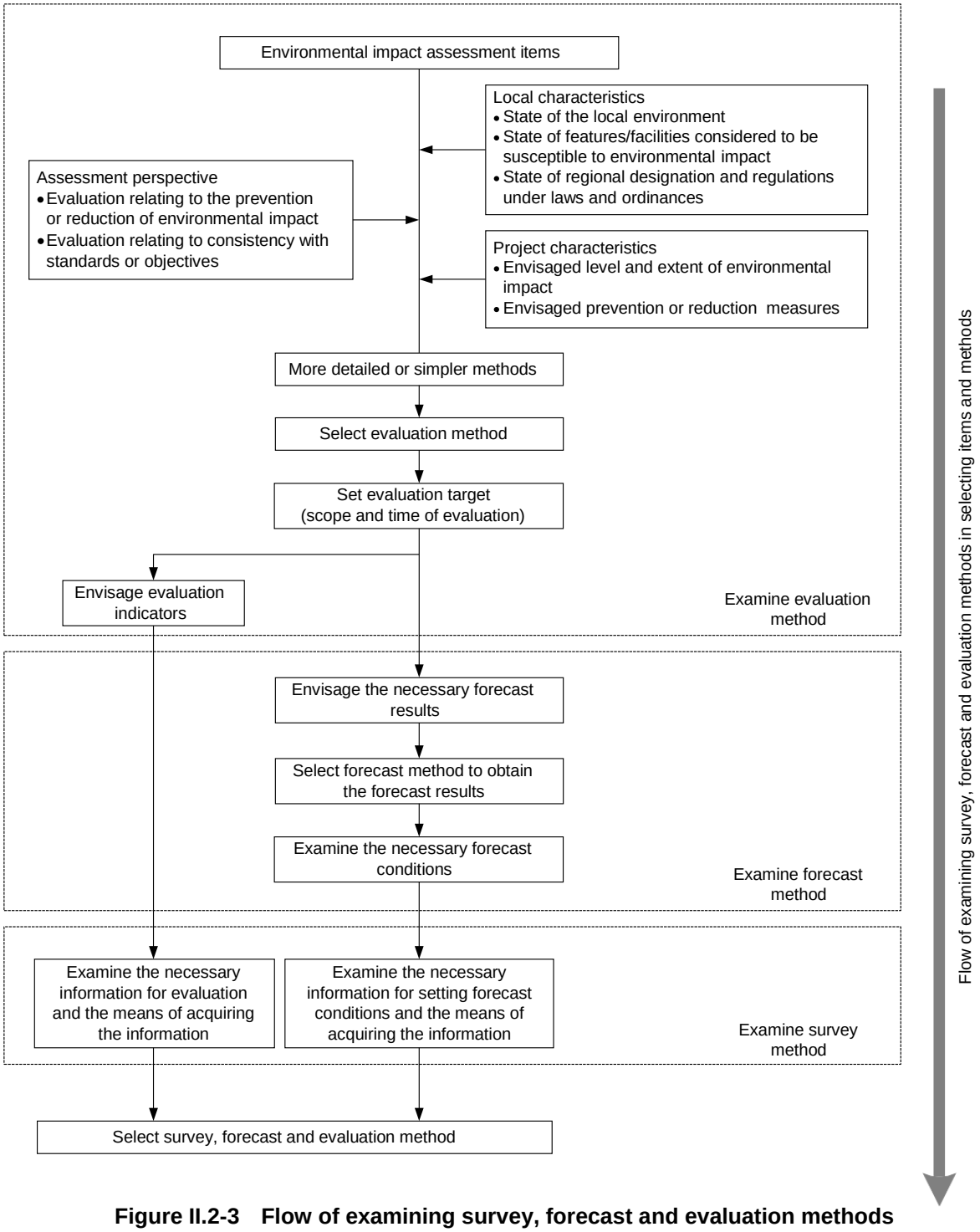


Figure II.2-3 Flow of examining survey, forecast and evaluation methods

2.3.2 Examples when examining more detailed survey and forecast methods

Regarding the items selected as environmental impact assessment items (selected items), if there is a possibility that the environmental impact that was envisaged from the project plan is especially pronounced, the adoption of more detailed survey and forecast methods than the reference methods (more detailed) where necessary should be examined. In contrast, if it becomes clear that the environmental impact is only minor, the adoption of simpler

survey and forecast methods than the reference methods (simpler) where necessary can be examined.

Making survey and forecast methods more detailed or simpler is not just the use of technically more advanced or simpler methods, but also to refine or simplify survey and forecast locations and forecast conditions.

The following examples can be considered when looking into making survey and forecast methods more detailed or simpler.

(Examples of when to consider making survey and forecast methods more detailed than the reference methods)

- When it is judged from the forecast results in the consideration document that there is a high level of forecast uncertainty.
- When there is a risk of significant environmental impact due to the project characteristics.
- When there are areas or features/facilities that are susceptible to environmental impact (see Table II.2-1)
- When there are areas or features/facilities that are designated from an environmental conservation perspective under laws and ordinances (see Table II.2-2).
- When there are areas where the environment has already seriously deteriorated or there is a high risk of serious deterioration (see Table II.2-3).
- When forecasting using the reference methods or other general methods is considered to be technically difficult because of the project or local characteristics.
- When there are aspects on which the local government or project proponent places particular emphasis from an environmental conservation perspective.

(Examples of when to consider making survey and forecast methods simpler than the reference methods)

- When it is clear from the forecast results in the consideration document that there will only be minor environmental impact.
- When it is envisaged that there will be no areas or features/facilities subject to environmental impact for a considerable period.
- When it is clear from similar project cases that there will only be minor environmental impact.

3. Survey

3.1 Survey concept

The purpose of the survey is to collect information that was not entirely clear from the survey to comprehend local characteristics in the consideration and scoping procedures (collecting and compiling existing information, or field study and exploration) so as to gain a more detailed comprehending of current conditions in the survey area, and also to obtain information necessary for forecast and evaluation.

These days there is a range of databases that can be used in environmental impact assessment. The use of these databases is to be encouraged as they can greatly improve the quality and efficiency of the environmental impact assessment.

3.2 Survey method

3.2.1 Examination of survey items

Survey items are selected to supplement any information on conditions relating to environmental components selected as environmental impact assessment items that could not be obtained from the survey to comprehend local characteristics, and also to use for forecast and evaluation.

3.2.2 Concept of survey method

As mentioned earlier, the survey method must be examined in the reverse sequence of "examination of evaluation method" → "examination of forecast method" → "examination of survey method". The reason for this is that the subject of the forecast and the subject of the survey differ according to the period and timing of the forecast or evaluation and the envisaged environmental impact, and this will have a major influence on the selection of the forecast and survey methods. Therefore, after clearly identifying the subject of the evaluation, it is necessary to examine a forecast method that is suited to the topographical and meteorological conditions and other local characteristics, then examine the survey method necessary to facilitate this forecast.

3.2.3 Concept of survey area and site

The Basic Matters stipulates the scope of the area (survey area) and the site (survey site) for the survey as follows.

(b) Survey area

The survey area shall be the area that includes areas where environmental conditions will change beyond a certain level, or the area where the environment will be altered directly and its surrounding area as a result of the implementation of the project, taking into account characteristics of the information used in the survey, and project and local characteristics.

(c) Survey site

Survey site within the survey area shall be site that are representative of the area, and other site that are suitable and effective for the collection of information, based on the

information details that should be comprehended depending on the characteristics of the selected items and the condition of features/facilities that may be significantly affected.
(Basic Matters; 4. Basic Matters Concerning Guidelines for Selecting Environmental Impact Assessment Items etc. 5(1))

1) Survey area

The survey area is naturally set in line with the characteristics of the environmental components, but even where the environmental components are identical, the survey area must be set according to impact factors at the time that the elements were selected as environmental impact assessment items (e.g., if the impact is on air quality due to the movement of construction vehicles, the area along the main route for those vehicles is set as the survey area, and if the impact is on air quality due to exhaust gas from a thermal power plant, the range that the exhaust gas spreads from the stack is set as the survey area). On the other hand, when environmental impact assessment items are considered to be closely interconnected, the survey area should be adjusted beforehand according to the evaluation method for each of the items to facilitate an efficient survey.

When using survey results obtained in the consideration document procedures, it is important to keep in mind that the concept of the survey scope may differ between the consideration document procedures and the scoping and subsequent procedures due to a difference in the maturity of the project plan.

2) Survey site

Survey sites are set with a view to the following.

- Sites that are representative of the area.
- Sites that provide an appropriate comprehending of the subject of the survey.
- Sites that may be significantly impacted.
- Sites with features/facilities that especially require consideration regarding environmental conservation.
- Sites where the environment has already seriously deteriorated.
- Sites where pollution is currently progressing.
- When using the results of surveys based on existing material relating to local characteristics for forecasting, it is important to confirm how representative the existing monitoring points are, and clearly indicate the confirmation findings.

3.2.4 Concept of survey period and timing

The Basic Matters stipulates survey period and timing as follows.

(d) Period and timing of survey

The period and timing of survey shall be the suitable and effective period and timing according to the information details that should be comprehended depending on the characteristics of the selected items, regional meteorological and hydrological characteristics, and social conditions. In this case, for subjects of surveys for which there is a need to

comprehend seasonal variations, a survey period that can enable an appropriate comprehending of such seasonal variations shall be secured, and for surveys that are to be conducted for a full year, the surveys are to be commenced as necessary at a time with the least envisaged variation in the observation results.

If long-term observation results already exist and a field survey is to be conducted, the said observation results and the results obtained from the field survey shall be compared.
(Basic Matters; 4. Basic Matters Concerning Guidelines for Selecting Environmental Impact Assessment Items etc. 5 (1))

- The period and timing to conduct the survey must be set taking into account natural and human-induced variations in the environment. For example, when conducting a survey for the full year, the survey period should be set so that the survey is not affected by any singular natural phenomenon of a given year.
- There is a need to be fully aware that the required survey period or time may vary depending on what has been selected as the subject of the evaluation (mean value, maximum value, etc.).

(Points to note) Commencement time of full-year surveys

For example, when surveying the annual number of visitors to a park that is a well-known site for cherry blossoms, if the survey period is set on a fiscal year basis (commencing on April 1), depending on whether the bloom time of the trees is early or late, there is a possibility that the result may not provide an accurate comprehending of the annual number of visitors. So for survey subjects that may produce vastly different survey results depending on the time when the survey is started, it is appropriate to set full-year survey periods to commence at a time during the year when the variation will be relatively slight.

4. Forecast

4.1 Forecast concept

Forecast is comprehending changes in environmental conditions or environmental load in the subject area through mathematical models, experiments, citing or analyzing case examples, and other methods to enable an appropriate evaluation of the extent of the environmental impact caused by the project.

If a relatively detailed forecast has been conducted in the document on primary environment impact consideration procedures, use of the forecast results in the consideration document may be examined as necessary.

- The forecast method would have already been set at the forecast stage so as to proceed with the examination in the sequence of examination of evaluation method → examination of forecast method → examination of survey method, but there is a need to again take into account survey results, as well as try to know the latest forecast and evaluation findings. This may result in the case needed to rethink the forecast and evaluation methods that were initially adopted.

- When selecting the forecast method, it is preferable to select the method that will quantitatively deliver the most solid results based on the knowledge at that time, but it should be kept in mind that forecasts will invariably contain errors or a degree of uncertainty stemming from the forecast method or conditions.
- It may be possible to reduce errors by testing the accuracy of the data used in the forecast, or analyzing the sensitivity of the parameters used, but this uncertainty in the forecast should be taken into account when conducting the evaluation, and there may also be a need to examine environmental mitigation measures or the implementation of a follow-up survey depending on the degree of uncertainty.
- To help reduce uncertainty in future forecasts, it is important to push ahead with research on forecast methods and conditions, and build up and analyze knowledge relating to the results of follow-up surveys and the outcomes of environmental mitigation measures.

4.2 Forecast method

4.2.1 Concept of forecast method

The forecast method must be at the level required for evaluation relating to the selected items in view of the characteristics of the environmental components themselves, and the project and local characteristics.

- For example, it is considered that confirming calculated values and observed values through historical calculations using forecast models can verify whether the level required for evaluation has been reached. When citing or analyzing similar project cases, it is necessary to compile similar and divergent aspects to clarify their adequacy as similar project cases.
- At present, there are environmental components for which forecast methods have not been established, so it is also necessary to refer to scientific papers and other similar publications, and forecast methods adopted overseas to comprehend the latest information. When referring to methods used overseas, it should be kept in mind that these methods may be premised on meteorological or topographical conditions different from those in Japan.

1) Concept of forecast conditions

In forecasting air quality or water quality, when seeking to comprehend the behavior of pollutants under a given natural state, it is necessary to first establish the conditions of that natural state. For this, conditions under which there will be maximum impact or average impact can be considered, but in either case, variations in the conditions and the extent of those variations must be taken into account. It should also be kept in mind that the average conditions do not necessarily lead to average environmental impact.

(Points to note) Setting future environmental conditions

For forecasts, future environmental conditions are set corresponding to the time of the forecast. In forecast results, the extent of the environmental impact attributable to the project must be identified with clear distinction between changes in environmental conditions caused by the project and the future environmental conditions.

The Basic Matters states that future environmental conditions (background) in the area brought about by business activities other than the project must be compiled so they are clearly identified, and taken into consideration in the forecast. It also states that where it is difficult to estimate future environmental conditions because of the current technological level, information availability, or other reasonable grounds, current environmental conditions can be used. However, even where estimating future environmental conditions is difficult, there is a need to comprehend qualitative trends, namely, whether the future environment is improving or deteriorating.

(Reference) Adaptation to climate change

From 2013 to 2014, the Intergovernmental Panel on Climate Change (IPCC) accepted and published the Fifth Assessment Report (The Physical Science Basis; Impacts, Adaptation, and Vulnerability; Mitigation of Climate Change, and Synthesis Report) bringing together the latest scientific knowledge.

The Fifth Assessment Report indicates that warming of the climate system is beyond doubt, it is extremely likely that anthropogenic impacts were a dominant factor in recent warming, and changes in climate are causing impacts on natural and human systems on all continents and across the oceans. The Report also forecasts that in all scenarios regardless of the amount of greenhouse gas emissions, future global averaged temperatures will rise, leading to greater risks from the impact of climate change toward the end of the 21st century.

Climate change countermeasures can be broadly classified into “mitigation”, which is controlling greenhouse gas emissions to halt the progress of climate change; and “adaptation”, which is adjusting nature and society concepts with regard to impacts that are already occurring or may occur. IPCC states that “Adaptation and mitigation are complementary strategies for reducing and managing the risks of climate change”, and must be promoted in parallel.

Japan is also experiencing rising temperatures, an increase in the frequency of heavy rain, a drop in the number of days of precipitation, and rising sea surface temperatures, while the impact of climate change is already appearing in a decline in the quality of farm produce due to high temperatures, decline or a change in distribution of alpine or subalpine vegetation, subtropical coral bleaching due to rises in sea surface temperatures, and early blooming of plants. In addition to further rises in sea surface temperatures, increase in the frequency of heavy rain, drop in the number of days of precipitation, and rising sea surface temperatures, an increase in precipitation due to heavy rain, increase in the maximum intensity of typhoons, and rising sea levels in the future are likely to have an impact on agriculture, forestry, fishery, the aquatic environment, water resources, natural ecosystems, natural disasters, health, and various other areas.

These days, adaptation-related research and initiatives are been tackled on a global scale, and in Japan, in November 2015 Cabinet approved the “National Plan for Adaptation to the Impacts of Climate Change” with a view to the government-wide systematic and comprehensive promotion of coordinated initiatives to tackle the various impacts of climate change. This is expected to further expand the knowledge base, and push adaptation into a more prominent position in government policy and planning. There is also a need to consider the impact of climate change when conducting environmental impact assessments in accordance with the state of research into climate change impacts on biodiversity, aquatic environments and water resources, and planning and implementation methods for adaptation measures, technological progress, and the accumulation of related knowledge and case examples.

2) Forecast uncertainty

When selecting the forecast method for environmental impact assessment, it is preferable to select the method that will quantitatively deliver the most solid results based on the knowledge at that time, but it should be kept in mind that forecasts will invariably contain errors or uncertainty.

Forecast uncertainty includes current natural and human-induced change that forms the premise of forecasts, measurement errors when comprehending current conditions, limitations of the forecast model itself, and uncertainty inherent in parameters and unit rates.

- There are various levels of forecast uncertainty, and the effect this uncertainty will have on the forecast result must always be kept in mind when conducting a forecast. And when writing up the forecast result, not only should the degree of uncertainty be recorded, but results based on flexibly applying multiple forecast conditions rather than adhering to a single forecast condition should also be recorded. In particular, regarding forecast conditions such as traffic volume that themselves contain assumptions, the adequacy and uncertainty of those conditions should be thoroughly verified.

(Points to note) Forecast uncertainty

• Existence of forecast errors and uncertainty

Concentration of pollutants, which is a subject of forecasts, and meteorological conditions and traffic volume, which are used in forecasts, are constantly changing. Many can be comprehended as a stochastic variation, but when viewed from a long-term perspective, they may indicate an anomalous variation.

In addition to forecast uncertainty due to stochastic or anomalous variation, there is also the possibility of natural or social variations that significantly alter future trends. This is considered to be a phenomenon that could not be envisaged when the forecast was conducted, so this can be seen as a forecast uncertainty.

The forecast method must fully comprehend the characteristics of the phenomenon that is the subject of the forecast (localized or wide-area occurrence, short- or long-term exposure), taking into account project and local characteristics, and be fully aware of the uncertainty inherent in the parameters and of the scope in which the method is applied. Any deviation from this application scope will give rise to significant uncertainty in the forecast result.

• Dealing with forecast errors and uncertainty

- Phenomenon variation

There is a need to be aware of the existence of any forecast error attributable to stochastic variation. For anomalous variations, it is possible to conduct an anomalous year test, then after estimating the anomalous value caused by the variation, carry out a rejection test.

- Forecast methods

The forecast methods and unit rates to be used should be those for which there is sample data and knowledge, and the precision is fully understood through experimental verification. They are regularly improved as knowledge expands, so after comprehending these technological trends, the forecast method and unit rates of the standard necessary for evaluation relating to the selected items must be selected.

When there are technical issues such as the uncertainty inherent in forecast model parameters and suitability of the application scope, there is a need to adopt a flexible approach including the recording of results based on multiple forecast conditions rather than adhering to a single result based on a single forecast condition. There may also be comparative studies of the forecast model, so citing such research results will also be effective.

- Assumed forecast conditions

It is also effective to set multiple future scenarios for forecast conditions that will be greatly affected by future social circumstances (road development plans, etc.), and conduct a forecast for each scenario. For example, for future traffic volume, multiple forecasts can be conducted with upper values and lower values of the assumed scenarios.

4.2.2 Concept of forecast area and site

The Basic Matters stipulates the scope of the area of the forecast (forecast area) and the location (forecast site) as follows.

(b) Forecast area

The scope of the area of the forecast (forecast area) shall be set as appropriate within the survey area for each selected item, taking into full account project and local characteristics.

(c) Forecast site

Forecast sites within the forecast area shall be sites that are representative of the area, sites that may be significantly affected, and sites that can provide an accurate understanding of the features/facilities that should be preserved, according to the characteristics of the selected items, condition of the features/facilities that should be preserved, and topographical, meteorological, and hydrological conditions.

(Basic Matters; 4. Basic Matters Concerning Guidelines for Selecting Environmental Impact Assessment Items etc. 5(2))

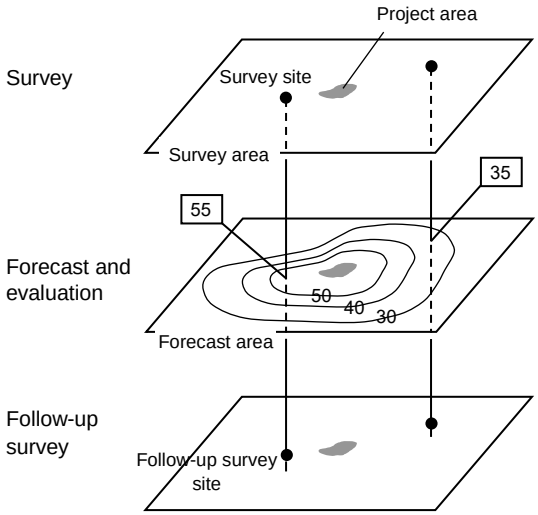
1) Forecast area

In principle, the forecast area is the area that includes areas where environmental conditions will change beyond a certain level as a result of the implementation of the project. The extent of this area will change depending on project scale or content, and is set as appropriate in consideration of forecast uncertainty and local characteristics.

The forecast area may be set with reference to the same concept for setting the survey area and have the same coverage, but if, after examining how the evaluation will proceed based on the forecast results, there is no need to set the entire survey area as the forecast area, the forecast area does not have to be the same as the survey area.

2) Forecast sites

If an evaluation is not required at a given site, a forecast site does not always have to be set, but where it is a “site that may be significantly impacted” or “site with features/facilities that especially require consideration regarding environmental conservation”, it is considered that these should be set as forecast sites. In setting forecast sites, it is preferable to also give consideration to sites where it is envisaged that follow-up surveys or monitoring surveys will be conducted.



Sites that are representative of the area, sites that may be significantly impacted, sites with features/facilities that must be given special consideration for environmental conservation, and sites prescribed in laws and ordinances are set as survey sites where a field survey is conducted to comprehend local environmental conditions.

Forecasts are conducted in the forecast area. Even when the forecast is done for the whole area, specific forecast results for sites that have features/facilities for conservation or prescribed in laws and ordinances should be indicated before carrying out the evaluation. → In this case, the sites should also be selected taking into account the follow-up survey and monitoring survey.

Conduct the follow-up survey and monitoring survey
→ The follow-up survey sites should be selected so that a comparison can be made with the survey or forecast results, based on the evaluation results and the purpose of the follow-up survey or monitoring survey.

Figure II.4-1 Setting forecast sites with a view to follow-up surveys

4.2.3 Concept of forecast time

The Basic Matters stipulates the forecast time as follows.

(d) Forecast time

The time of the forecast shall be set as the time of the steady state and of the maximum impact after service commencement (only when this time can be set) or the time of maximum impact due to construction works that provides an accurate understanding of the environmental impact for each selected item, taking fully into account project characteristics, local meteorological or hydrological characteristics, and social conditions.

A forecast shall be conducted at an intermediate time as required when a considerable period of time is required for the land etc. to reach a steady state after service commencement following the completion of construction or the conditions on which the forecast is premised change significantly during the forecast period, or when it is expected that land etc. will commence service before construction works relating to the project have been completed.
(Basic Matters; 4. Basic Matters Concerning Guidelines for Selecting Environmental Impact Assessment Items etc. 5(2))

1) During construction

The forecast time during construction is set by comprehending chronological changes in the construction amount and construction area for the entire construction plan, then identifying the time that the construction has the maximum impact on the environment (see Figure II.4-2(A)).

If the construction extends over an extremely long period, or if there is likely to be a variation in the forecast conditions such as a change in the route that construction vehicles take during construction, carrying out a forecast at an intermediate time during construction will also have to be examined.

2) After service commencement

The forecast time after service commencement is the time that the operation of the facility or vehicle traffic reaches a steady state (see Figure II.4-2(A)).

When a steady state will not be reached for a considerable period after service commencement, or when the conditions on which the forecast is premised change significantly during the period until the steady state is reached, such as the partial opening of two temporary lanes in a road construction, an intermediate forecast time is to be set (see Figure II.4-2(D)).

3) Miscellaneous

Depending on the project, construction is carried out in stages, so it is envisaged that the construction period and the service commencement period will overlap (Figure II.4-2(B)). In such cases, the forecast time relating to the construction is the time when the environmental impact is envisaged to be the greatest after an examination of the impact factors due to construction together with the impact factors due to the service (e.g., equivalent traffic volume adjusted for large and small vehicle unit rates).

If it is envisaged that, for example, features/facilities that especially require consideration will newly emerge during the construction period, the forecast time is set as necessary taking into account the time that the said features/facilities will emerge (see Figure II.4-2(C)).

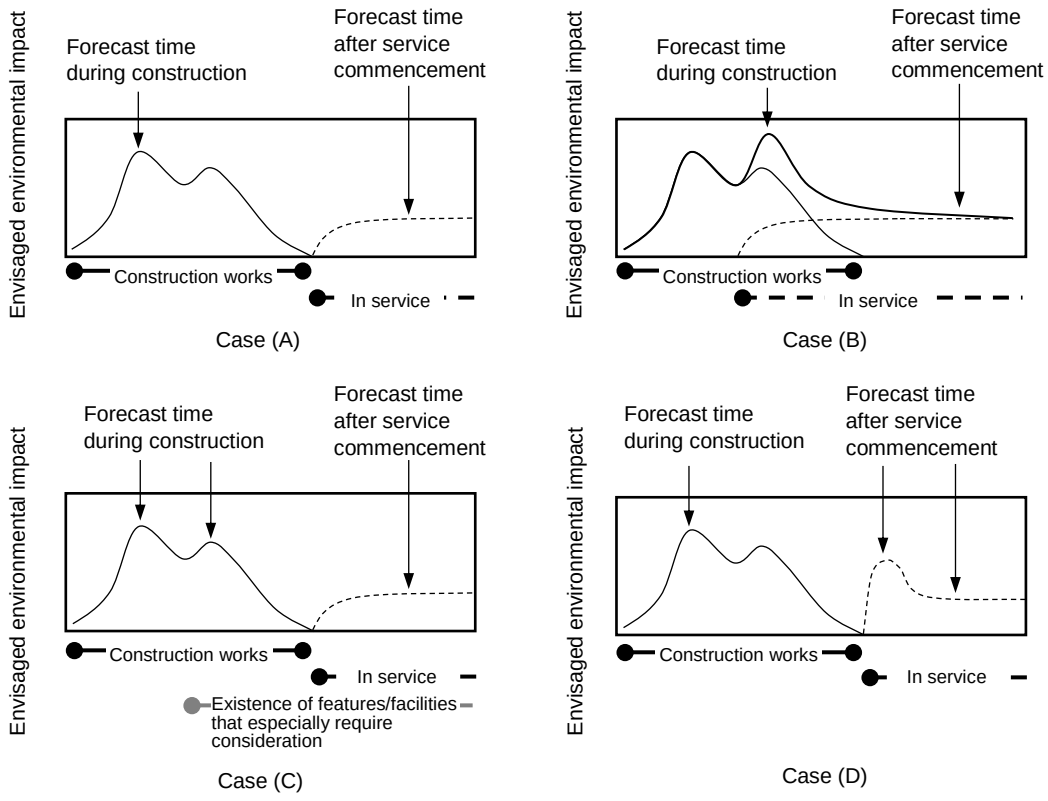


Figure II.4-2 Concept of forecast time

5. Environmental mitigation measures

The Basic Matters stipulates environmental mitigation measures as follows.

> Environmental mitigation measures concerning the impact that the implementation of the project may have on the environmental components relating to the selected items shall be examined for the purpose of preventing or reducing the said impact, and achieving the standards or objectives from various environmental conservation perspectives relating to the said impact within the scope that can be executed by the project proponent.
> (Basic Matters; 5. Basic Matters Concerning Guidelines for Environmental Mitigation measures. 1(2))

5.1 Concept of environmental mitigation measures

Environmental mitigation measures are examined for the purpose of preventing or reducing the impact caused by the project within the scope that can be executed by the project proponent in the process of carrying out the survey, forecast and evaluation. Environmental mitigation measures are aimed at reflecting appropriate environmental considerations in the project plan, so they are vital in the environmental impact assessment process, and must be examined and compiled as specifically as possible according to the progress of the project plan, and based on the plan content, effect and adequacy.

When examining environmental measures in the project implementation stage, it is important to specify the effect of serious environmental impact prevention or reduction through the examination of multiple drafts in the planning stage, and also show the effect of environmental impact prevention or reduction through the examination of a series of project plans.

- When examining environmental mitigation measures, depending on the project impact factors, consideration must be given to whether there are any areas or features/facilities susceptible to environmental impact, whether there are any areas or features/facilities prescribed by laws or ordinances from an environmental conservation perspective, and whether there are any areas where the environment has already significantly deteriorated or there is a high risk of such deterioration.
- Environmental mitigation measures are a broad concept that ranges from measures to prevent environmental impact to those that compensate for unavoidable impact, but when examining environmental mitigation measures, priority must be given to the prevention or reduction of environmental impact, and when, in the light of these examinations, prevention or reduction beyond this is difficult, measures to compensate for the impacts must be examined as necessary.
- In this paper, prevention, reduction, and compensation indicate the following.

Prevention: Prevent impacts by not executing all or part of an action (an action in the project that becomes an impact factor). Not causing impacts by keeping

impact factors away from environmental components that are predicted to suffer significant impact is also referred to as prevention.
In short, it is a measure to ensure that impact factors or impacts caused by those factors do not happen.
(Examples) Project suspension, change of the content of the project (change to project content that does not give rise to those impact factors), and change of the project area or route, etc.

Reduction: Reduction includes the environmental mitigation measures of "minimize", "modify", and "alleviate/eliminate". Minimize is to minimize the impact by limiting the degree or scale at which the action is implemented; modify is to modify the impact by repairing, regenerating or restoring the affected environment itself; and alleviate/eliminate is to alleviate or eliminate the impact by protecting or maintaining the environment during the implementation of the action.
In summary, this is to keep impact factors or the occurrence of impacts to the minimum through some form of means, or repair through some form of means any impact that has occurred.
(Examples) Change of the construction processes, change of facilities and structures, greening, and erecting soundproof walls, etc.

Compensation: This is to compensate the value of the environmental components that will be damaged from an environmental conservation perspective by creating the same kind of environmental components as those that will be damaged.
That is, this is a measure for mitigating the overall impact by newly creating places or functions of a value commensurate with the environment that will be lost or impacted.

- It is, however, difficult to strictly categorize whether the effect of the environmental mitigation measures actually carried out prevented or reduced the impact on the environment. Looking at changing the route for construction vehicles as an example, when considering the positional relationship of the features/facilities that should be preserved in a residential area, in some cases it will be viewed as a reduction while in others it will be a prevention, depending on the extent of the detour.
- The concept of prevention and reduction differs depending on the perspective or how the extent of the impact reduction is perceived, so differentiating whether the environmental mitigation measures to be implemented are prevention or reduction is not important. What is important is to carry out the examination from the viewpoint of how much the impact on the environment can be reduced.

- When the quality of the environment itself will be changed, such as air pollution or water pollution, implementing the compensation concept of creating a similar environment is, in all reality, difficult. Therefore, focusing on how to prevent or reduce the impact on the environment is vital when examining environmental mitigation measures.
- "Reparation" types of measures are not dealt with as environmental mitigation measures in the Environmental Impact Assessment Act.

5.2 Procedures for examining environmental mitigation measures

5.2.1 Examining environmental mitigation measures policy

In examining environmental mitigation measures policy, consideration must be given to project and local characteristics relating to the environmental components (e.g., positional relationship between the project area and features/facilities that especially require consideration) as well as the impact on other environmental components, while also considering the effect of the prevention or reduction of serious environmental impact through the examination of multiple drafts during the planning stage.

5.2.2 Examination of environmental mitigation measures according to project plan maturity

Examination of environmental mitigation measures must conform to the maturity of the project plan. This is because examining suitable environmental mitigation measures may be difficult for plans that are close to being finalized. But suitable environmental mitigation measures can be implemented by adjusting environmental mitigation measures policy from the project plan stage and setting the content and method of these measures to conform to the maturity of the project plan.

When examining environmental mitigation measures, it is necessary to show the effects of environmental impact prevention or reduction through the examination of the series of plans, together with the effects of serious environmental impact prevention or reduction by the examination of multiple drafts from the consideration document procedures.

(Points to note)

When changing the project plan after the impact statement has been released, if the change is to reduce the project scale or if the change falls within the scope of a minor change set down in the respective environmental impact assessment systems, there is no need to redo the environmental impact assessment procedures. However, even where the change falls within the scope of a minor change, depending on the environmental components there may be cases in which the environmental impact will actually be greater than that in the previous plan. It is also possible that local characteristics may change, such as a change in environmental conditions in the project area or surrounding area after the implementation of the environmental impact assessment.

Therefore, when deciding on the project plan, it is necessary to ensure that again appropriate consideration is given to conservation of the environment in the project, taking fully into account the process of the examination relating to environmental conservation considerations that had been conducted through the series of environmental impact assessment procedures, including the content of examinations relating to the prevention or reduction of serious environmental impact during the planning stage, the degree of environmental impact in the draft statement or impact statement procedures, and the content of examinations for setting the environmental mitigation measures.

5.2.3 Examination of multiple draft environmental mitigation measures and the examination process

Examinations of environmental mitigation measures consist of a comparative examination of multiple drafts considering the outcomes and feasibility of the measures to be adopted, or an examination on whether the best practicable technologies are being incorporated into the measures. In fact, measures are selected with preference given to those that are highly feasible and can efficiently prevent or reduce environmental impact caused by the project, after which the forecast and evaluation relating to those measures are repeated.

- To ensure that the best practicable technologies are incorporated, even where environmental mitigation measures selected for one reason or other deliver an outcome that satisfies the standards or objectives, those measures may not always be the optimum from an outcome or feasibility perspective, so it is important to carry out a comparative examination on a number of other environmental mitigation measures to determine whether to adopt measures with a higher outcome but a somewhat lower feasibility or those with a somewhat lower outcome but an assured feasibility. The Environmental Impact Assessment Act stipulates that the process of comparative examination of multiple drafts shall be clearly specified, so the examination process and examination results must be recorded in the draft statement or impact statement as specifically as possible.
- Environmental mitigation measures are implemented to the extent that is practicable for the project proponent, and it is possible for the details of the project plan (e.g., layout plans or construction methods) to be changed as a result of the examination of the environmental mitigation measures if it is judged to be fully practicable from a technological, cost, realistic and specifics perspective. When the project plan will be significantly changed for the purpose of reducing environmental load, the process of examining environmental mitigation measures must be clearly shown in chronological order, and must be compiled in a way that can be easily understood by local residents and others.

5.2.4 Confirming the impact on other environmental components and impact remaining even with the implementation of measures

Evaluation of negative impact on other environmental components due to the implementation of environmental mitigation measures and the extent of the environmental impact remaining even with the implementation of measures should be compiled as objectively as possible, and this should also include the degree of uncertainty.

- When environmental mitigation measures are being implemented, even where the full outcome of those measures is recognized there is a possibility this could give rise to new environmental impacts on other environmental components, including the blocking of sunlight caused by the installation of soundproof walls or panels as a noise countermeasure.

In such cases, the degree of the new environmental impact must be fully examined, and where necessary, additional or revised environmental mitigation measures must be adopted as appropriate.

5.3 Verifying the adequacy of environmental mitigation measures

The Basic Matters stipulates the verification of the adequacy of environmental mitigation measures as follows.

> When examining environmental mitigation measures, the adequacy of the environmental mitigation measures that are to be adopted must be verified through a comparative examination of multiple drafts of the environmental mitigation measures and an examination on whether the best practicable technologies are being incorporated into the measures, and the process of these examinations must be clearly defined. In this case, if the said examinations are conducted in stages, the specific details of the environmental mitigation measures must be clearly defined for each stage. Moreover, when a comparison of multiple drafts concerning location etc. was conducted, details of the examination on how the environmental impact will be prevented or reduced in the process leading to the decision on the site relating to project from the multiple drafts concerning the said site must be clearly defined.
> (Basic Matters; 5. Basic Matters Concerning Guidelines for Environmental Mitigation measures. 2(5))

- Verification of the adequacy of environmental mitigation measures is normally done by comparative examination of multiple drafts and an examination on whether the best practicable technologies are being incorporated into the measures, and is done with a view to prevention or reduction outcomes from environmental mitigation measures, degree of uncertainty, and possible impacts on other environmental components.
- Comparison of multiple drafts means to examine multiple environmental mitigation measures for the forecast environmental impacts, then examine the respective effects, uncertainties, and impacts on other environmental components, and finally conduct a comparative examination of those results. From this, the environmental mitigation measures judged to provide suitable and adequate outcomes will be adopted.
- Judgment on whether the best technologies are incorporated must show the outcomes of environmental mitigation measures as objectively as possible by referring to the latest research or similar case examples, expert advice, and, depending on the situation, conducting preliminary tests. If the outcome of the environmental measures to be adopted are judged to be uncertain or unknown, the degree of uncertainty must be clearly shown.
- Since judgment on the adoption of environmental mitigation measures must be based on the verification of adequacy mentioned above and the Environmental Impact Assessment Act stipulates that the verification results must be clearly indicated in the evaluation, the examination process and results must be recorded as specifically as possible in the draft statement and impact statement.

- When adopting environmental mitigation measures that are not technologically established, and about which there is incomplete knowledge regarding their outcomes, the outcomes of the adopted environmental mitigation measures must be confirmed by follow-up surveys as the project proceeds.
- When adopting environmental mitigation measures about which there is incomplete knowledge, the possibility of impacts on other environmental components must also be considered, and the implementation of follow-up surveys may be considered as necessary.

5.4 Examination of the need for follow-up surveys

Follow-up surveys are considered from the perspective of compensating for forecast uncertainty in the environmental impact assessment, and the Basic Matters provides examples when examining the need for follow-up surveys as follows.

> When there is considerable forecast uncertainty relating to the selected items, when adopting environmental mitigation measures about which there is incomplete knowledge regarding their outcomes, and when enhancing the detail in the content of the environmental mitigation measures during construction or after service commencement, the need for a survey to comprehend the environmental conditions etc. during construction and after service commencement (hereinafter referred to as "follow-up survey") must be examined according to the severity of the impact on the environment, and when adopting compensation measures, the need for a follow-up survey must be examined according to the severity of the impact on the environment caused by the project, taking into account the degree of uncertainty about the outcome of the compensation measures and the extent to which knowledge relating to the said compensation measures is enhanced. Moreover, the content of the follow-up survey items and methods, policies when it has become clear by the results of the follow-up survey that the environmental impact is significant, and the results of the follow-up survey are to made available to the public.
> (Basic Matters; 5. Basic Matters Concerning Guidelines for Environmental Mitigation measures. 2(6))

- When selecting the forecast method for environmental impact assessment, it is preferable to select the method that will quantitatively deliver the most solid results and use one whose precision is fully understood, but it should be kept in mind that forecasts will invariably contain uncertainty.
- Environmental mitigation measures that take into account project and local characteristics are implemented according to the degree of impact by the project, but not all of the measures have an outcome that is fully known. Therefore, when it is judged from the degree of forecast uncertainty and the extent of the effect that the incomplete knowledge on the environmental mitigation measures has on the forecast results that "there is significant forecast uncertainty" and that "environmental mitigation measures about which there is incomplete knowledge will be adopted", the need to comprehend environmental conditions after the project's implementation through a follow-up survey should be examined according to the severity of the impact on the environment.

- In some cases it can take almost a decade from the time environmental mitigation measures are examined in an environmental impact assessment to the time those measures are actually adopted. There are also many cases where surveys are reimplemented during construction or after service commencement to flesh out the details of environmental mitigation measures, and these kinds of surveys are also viewed as follow-up surveys.
- When adopting compensation measures, the need for a follow-up survey should be examined according to the severity of the impact on the environment, taking into account the degree of uncertainty about the outcome and the extent to which knowledge relating to the compensation measures is enhanced.

5.4.1 Forecast errors and uncertainty

When implementing forecasts, effort must be made to reduce uncertainty, which is caused by a range of factors, however, uncertainty can never be completely eliminated from forecast results. Therefore, the implementation of a follow-up survey should be examined in consideration of the degree of uncertainty and the severity of the environmental impact.

- In conducting a follow-up survey, it goes without saying that comprehending the environmental impact caused by the project is a core objective, but at the same time, it is desirable to examine effective follow-up survey methods so that the follow-up survey can determine at the time of construction or service commencement the condition of the factors considered to be causing a high degree of forecast uncertainty (e.g., traffic volume in forecasting noise, or amount of precipitation in forecasting water turbidity).
- To this end, it is essential to select a follow-up survey method (survey items, location, and time) that also facilitates an comprehending of the factors causing the forecast uncertainty, and enables a comparative examination between the follow-up survey results and the environmental impact assessment results.

5.4.2 Environmental mitigation measures about which there is incomplete outcome-related knowledge

Environmental mitigation measures about which there is incomplete outcome-related knowledge are those measures about which there is little knowledge concerning the outcome because of new technologies used or other factors and the outcome has not been determined, or those measures whose outcome cannot be accurately foreseen due to differences in forecast conditions, or methods including variations in survey equipment specifications.

- The implementation of a follow-up survey should be examined in the light of the degree of uncertainty about the outcome of the environmental mitigation measures due to incomplete knowledge, and the severity of the environmental impact.

• For this, there is a need to identify aspects where there is incomplete knowledge when considering the outcomes of the environmental mitigation measures, then select specific follow-up survey methods based on this.

5.4.3 Severity of the environmental impact

In selecting follow-up survey items, there is a need to consider the severity of the environmental impact according to project and local characteristics. Even where there is forecast uncertainty and there is incomplete knowledge regarding the environmental mitigation measures, if the impact on the environment is unlikely to be severe, it is not always necessary to conduct a follow-up survey.

• It is difficult to make an unequivocal judgment about the degree of forecast uncertainty and the degree to which knowledge about environmental mitigation measures is incomplete. Therefore, judgment is generally made taking into account the degree of uncertainty or the extent of the effect on the forecast or evaluation results attributable to the incomplete knowledge.

6. Evaluation

The Basic Matters stipulates evaluation methods as follows.

(a) Evaluation relating to prevention or reduction of environmental impact

The evaluation is to be made on whether the possible impact on the environmental components relating to the selected items by the implementation of the project has been prevented or reduced by such methods as a comparative examination of multiple drafts either chronologically or in parallel, focusing on wide-ranging environmental mitigation measures including the structure and layout of buildings, environmental conservation facilities and construction methods, and an examination of whether the best practicable technologies have been incorporated. In this case, the grounds for the evaluation and process of the examination must be clearly defined.

These evaluations are to be implemented by the project proponent to the extent practicable.

(b) Examination on consistency with national or local government environmental mitigation measures

In conducting evaluations, when standards or objectives concerning environmental components relating to the selected items are specified by environmental standards, environmental master plans, or other national or local government measures and policies on environmental conservation, the evaluation must clearly indicate that it is following the said standards and objectives, and examine whether the survey and forecast results are consistent with the state of achievement of the said standards etc., and the objectives and the content of the environmental master plans etc.

Also in the case where there are environmental components that may be affected over an extended period in the course of the project's implementation and environmental standards

relating to those environmental components have been set, consistency with the said environmental standards must be examined.
(c) Other points to note
In the course of the evaluation, when estimating the outcome of environmental mitigation measures implemented by a person other than the project proponent, the content of the said measures etc. must be clearly defined.
(Basic Matters; 4. Basic Matters Concerning Guidelines for Selecting Environmental Impact Assessment Items etc. 5(3))

6.1 Evaluation concept

The evaluation during the project implementation stage includes evaluation relating to preventing or reducing environmental impact, and evaluation relating to consistency with national or local government environmental mitigation measures and policies. While it is impossible to achieve zero environmental impact in the implementation of the project, the evaluation relating to preventing or reducing environmental impact should clearly indicate how the plan is designed to prevent or reduce environmental impact, and what examinations have been done and considerations given to this end.

6.2 Evaluation methods

6.2.1 Evaluation relating to prevention or reduction

The evaluation relating to prevention or reduction must clearly indicate the efforts made by the project proponent to prevent or reduce environmental impact, and through an objective examination of whether the effect and the adequacy of the technologies in the adopted environmental mitigation measures have been clarified, judge whether the environmental impact caused by the project has been prevented or reduced by the environmental mitigation measures.

- The relative evaluation method by compiling and clarifying the details of the effort toward prevention or reduction includes the method of conducting a comparative examination of multiple drafts relating to broad-ranging environmental mitigation measures, and the method of examining whether the best practicable technologies are being incorporated into the measures. The method of indicating a comparative examination of multiple drafts includes the method of chronologically showing the examinations of environmental mitigation measures, and the method of specifying the reference material relating to the effect of multiple environmental mitigation measures for judging the best practicable technologies.
- When incorporating the fact that the environmental mitigation measures to be implemented in the project are effective in the evaluation relating to prevention or reduction, it is essential that the environmental mitigation measures are comparable to those adopted in a project with similar characteristics or of a similar scale, and their outcome is clearly understood.

• The key point in the evaluation relating to prevention or reduction is that when the environmental mitigation measures are not consistent with national or local government environmental mitigation measures or policies in areas where, under present conditions, environmental standards have not been reached, prevention or reduction measures are examined further from an environmental impact prevention or reduction perspective, then a comprehensive evaluation is made covering both evaluations. In such cases, the details of or reasons for the lack of consistency with the standards etc. must be clearly stated, and an examination and evaluation must be conducted on whether the best practicable technologies have been incorporated from the extent to which the addition [[load??]] associated with the implementation of the project will be reduced by the prevention or reduction measures (reduction rate).

(Points to note) Concept of "best practicable technologies"

The Basic Matters gives "examination of whether the best practicable technologies have been incorporated" as one example of evaluation methods concerning prevention and reduction.

"Incorporating the best practicable technologies" is a concept introduced in licensing in Europe and North America, and has been adopted in Japan for environmental impact assessments in such areas as power generation. The project proponent evaluates the performance of various technologies for use in the project from an environmental conservation perspective, selects several types considered to be the highest level, and, taking into account local and project characteristics, adopts those for the project to the extent practicable. From examples in Europe and North America, whether the technologies are "practicable" is decided after first examining them from primarily technical aspects, then looking at the economic side, and finally holding discussions with and seeking advice from industry circles, NGOs and various other interested parties.

In environmental impact assessments in Japan, in the example of the new establishment of a thermal power plant, the project proponent comprehended primarily the combustion technologies and exhaust gas technologies that have been adopted and that are expected to be introduced in similar project cases, and the state of scientific research or technological developments in that particular field, then made an evaluation based on whether the highest level of technologies from an environmental conservation perspective can be introduced before the project starts.

"Evaluation relating to prevention or reduction" in environmental impact assessments is nothing more than evaluating the effort by the project proponent regarding environmental conservation. The important point in the evaluation concerning the adoption of the "best practicable technologies" is therefore the effort made and the examinations conducted (or being conducted) by the project proponent regarding the adoption of those technologies, and the process of consulting with local residents and local governments after the effects of adopting those technologies became clear. This evaluation method can apply not just to power plant projects, but to all project types, and should be used extensively.

In the examination of whether the best practicable technologies have been incorporated, it is essential to clarify what technologies can be adopted in the project and what technologies were adopted in the said project to make an objective judgment about the adequacy of the evaluation. The effects from those technologies must be indicated as quantitatively as possible, and if there were any technologies that could not be adopted, the reasons must also be presented clearly.

6.2.2 Evaluation relating to consistency with standards or objectives

While the evaluation relating to prevention or reduction of environmental impact is fundamental, when environmental standards have been set or specific standards or objectives are clearly stated in the environmental master plan or environmental management plan within "national or local government environmental mitigation measures or policies", together with the evaluation relating to environmental impact prevention or reduction, an

examination must be carried out on whether the project environmental mitigation measures are consistent with these government measures or policies.

- Evaluation relating to consistency with standards or objectives means to evaluate whether project environmental mitigation measures are in line with environmental mitigation measures or policies formulated by the national or local government, and after comprehending how the reference standards or objectives are positioned within the environmental mitigation measures and policies, the idea behind using the said standards or objectives for evaluation must be clarified.
- For example, when objectives that take into account local characteristics are indicated in the regional environmental master plan or environmental management plan, there is a need first to determine the idea behind referring to these objectives based on how they are positioned in the environmental mitigation measures and policies and the background to the setting of the objectives, then evaluate consistency with those objectives.
- When comparing the standards or objectives with the forecast results, it is important to evaluate not just from the perspective of whether the forecast results meet the standards or objectives, but also from the perspective of whether the degree of impact from the project compared to the standards or objectives may hinder environmental conservation.

6.2.3 Other points to note

The project proponent cannot be responsible for implementing environmental mitigation measures drawn up by an entity other than the project proponent, so when carrying out an evaluation on such environmental mitigation measures, the content of these measures must be clearly and specifically stated at least within the scope of responsibilities to be applied with respect to the evaluation.

- The fact that the project plan and the content, outcome and implementation time of the environmental mitigation measures to be implemented by a person other than the project proponent are consistent, and that budget measures for these have the prospect of materializing must be clearly indicated based on objective documents and other material.

7. Follow-up survey

The Basic Matters stipulates follow-up surveys as follows.

When there is considerable forecast uncertainty relating to the selected items, when adopting environmental mitigation measures about which there is incomplete knowledge regarding their outcomes, and when enhancing the detail in the content of the environmental mitigation measures during construction or after service commencement, the need for a survey to comprehend the environmental conditions etc. during construction and after service commencement (hereinafter referred to as "follow-up survey") must be examined according to the severity of the impact on the environment, and when adopting compensation measures, the need for a follow-up survey must be examined according to the severity of the impact on the environment caused by the project, taking into account the degree of uncertainty about the outcome of the compensation measures and the extent to which knowledge relating to the said compensation measures is enhanced. Moreover, the content of the follow-up survey items and methods, policies when it has become clear by the results of the follow-up survey that the environmental impact is significant, and the results of the follow-up survey are to made available to the public.

When conducting a follow-up survey, consideration must be given to the following.

(a) Follow-up survey items and methods must be suitable according to the need for the follow-up survey, characteristics of the follow-up survey items, and local characteristics based on objective and scientific grounds with expert advice as required, and must be set in a way that enables a comparative examination between the follow-up survey results and the environmental impact assessment results.

(b) To prevent or reduce the environmental impact associated with the implementation of the follow-up survey itself, the follow-up survey method that causes the least amount of impact on the environment must be selected and adopted where possible.

(c) When environmental monitoring carried out by the local government is used in the follow-up survey and it is clear that the facilities connected with the project are to be handed over to a separate entity, the method and details of the cooperation with the other entity or request to the other entity must be clearly indicated.

(d) The judgment on concluding the follow-up survey and that of implementing and concluding the environmental mitigation measures based on the result of the follow-up survey must be examined objectively and scientifically with expert advice as required.

(Basic Matters; 5. Basic Matters Concerning Guidelines for Environmental Mitigation measures. 2(6))

7.1 Concept of follow-up survey

Environmental impact assessments are conducted before the project is implemented, so the follow-up survey is viewed as compensating for uncertainty in that result, and when there is considerable uncertainty in the forecast or when adopting environmental mitigation measures about which there is incomplete knowledge regarding their outcomes, the need for a follow-up survey must be examined according to the severity of the impact on the environment. There is also a need to examine additions to or revisions of the environmental mitigation measures as required based on the results of the follow-up survey.

It is specified in environmental impact assessment procedures that the plan regarding the follow-up survey items and methods must be recorded in the impact statement, and that guidelines for the response when it is clear from the follow-up survey results that the environmental impact will be pronounced must also be clearly recorded.

The follow-up survey results must be recorded in the impact mitigation report.

7.2 Follow-up survey items and methods

7.2.1 Examination relating to the follow-up survey items

The follow-up survey is viewed as compensating for uncertainty in the environmental impact assessment forecast or outcome of the environmental mitigation measures, and the Environmental Impact Assessment Act stipulates that when there is significant forecast uncertainty or when adopting environmental mitigation measures about which there is incomplete knowledge regarding their outcomes, the follow-up survey must be conducted in accordance with the severity of the environmental impact.

Therefore, the follow-up survey items must be examined after each of the selected items in the environmental impact assessment has been compiled in a way that clarifies the forecast uncertainty or the uncertainty of the outcome of the environmental mitigation measures to be adopted.

7.2.2 Concept relating to follow-up survey method

The follow-up survey is premised on comprehending the actual environmental impact accompanying the implementation of the project, and also drawing a comparison with the results of the survey conducted in the environmental impact assessment or the forecast results, and a suitable method must be examined in accordance with the characteristics of the environmental impact assessment items under which the follow-up survey is to be conducted, and local characteristics.

The follow-up survey method should produce results that can be compared with those of a survey on current conditions, and record results for each follow-up survey item as specifically as possible.

- In most cases the official methods of measuring air pollutants, noise and other pollution are set, so, basically, these methods should be followed.
- There is also a possibility that the follow-up survey method may be changed or supplemented after the publication of the impact statement to give appropriate environmental conservation considerations in implementing the project due to a change in the environmental conditions in the project area or surrounding area or other special circumstances.
- Follow-up survey methods require examinations based on objective and scientific grounds, so expert advice must be obtained as necessary.

- Effective use should be made of available results of surveys conducted by entities other than the project proponent, such as the results of environmental surveys by national or local governments (air pollution monitoring data, road traffic census data, public waters water quality monitoring data, and groundwater level monitoring data).
- There are also cases where, subsequent to the environmental impact assessment, the project proponent voluntarily conducts environmental monitoring surveys separate from the follow-up survey, and makes those survey results available to local residents.

7.2.3 Concept of follow-up survey area and site

The follow-up survey site is essentially the site where the survey on current conditions or forecast was conducted, and should preferably be a site that, where possible, will not be affected by other projects or surrounding features.

To this end, it is important to set suitable sites at the time of the environmental impact assessment survey and forecast; for example, selecting the prevailing wind direction so that there will be no effect from air pollutants emitted by other projects.

If there is a clear recognition that an area requires a follow-up survey after the publication of the impact statement, it is appropriate to examine the addition of a follow-up survey site as necessary.

7.2.4 Concept of follow-up survey period and timing

It is desirable that the follow-up survey period is set so that a comparative survey can be made with the environmental impact assessment results. As a rule, follow-up surveys are conducted at the forecast time set in the environmental impact assessment. If the forecast or evaluation is carried out at the time the project activities reach the steady state after service commencement, the follow-up survey is conducted once the forecast conditions have been established.

To comprehend the process when there is an extended period until the forecast time, the follow-up survey must be conducted at the proper time taking into account the progress of the project, even though it may only be midway through the period until the forecast time.

Follow-up surveys when adopting environmental mitigation measures whose outcome is uncertain must be conducted at the time that the outcome of the environmental mitigation measures can be properly comprehended.

7.3 Examination of supplementary environmental mitigation measures

When it is confirmed from the follow-up survey that the impact on the environment is much greater than the forecast result, the environmental mitigation measures must be supplemented or re-examined as necessary. The follow-up survey is viewed as compensating for forecast uncertainty, and the most important aspect in the follow-up survey is the examination of supplementary environmental mitigation measures according to follow-up survey results.

- When there is a possibility that supplementary environmental mitigation measures will be examined, the follow-up survey must be planned to facilitate their implementation.
- When there is a disparity with the forecast results, identifying the cause of this disparity will be helpful in improving the accuracy of future forecast methods and knowledge about environmental mitigation measures.

An examination based on objective and scientific grounds is essential when making a judgment on concluding the follow-up survey, so expert advice should be obtained according to the necessity of the examination. For example, if certain measures have been adopted and the results of the follow-up survey fall within the scope of the previously made forecast, the environmental mitigation measures can be concluded.

8. Impact mitigation report

The Basic Matters stipulates the preparation of impact mitigation reports as follows.

(1) The impact mitigation report relating to the project must be prepared in accordance with the guidelines on preparing impact mitigation reports pursuant to the provisions of Article 38-2 Paragraph (2) of the Act.
(2) In principle, the impact mitigation report is prepared once when construction relating to the project has concluded, and in this case, after the outcome of the environmental mitigation measures adopted during the implementation of the said construction has been confirmed, effort must be made to include those results in the impact mitigation report.
(3) The results of the follow-up survey or environmental mitigation measures must be publicly released during construction or after service commencement as necessary.
(Basic Matters; 6. Basic Matters Concerning Guidelines for Preparation of Impact Mitigation Reports. 1)

8.1 Concept relating to preparation of the impact mitigation report

Through the release of the outcome of the environmental mitigation measures and the results of the follow-up survey, the procedures for preparing the impact mitigation report will enhance environmental considerations during construction and after service commencement, and are an effective approach from the viewpoint of securing public trust, ensuring transparency and objectivity, and improving survey, forecast and evaluation techniques.

With a view to compensating for any uncertainty associated with the forecast and the outcome of the environmental mitigation measures envisaged in the environmental impact assessment conducted before the implementation of the project, the impact mitigation report must record environmental mitigation measures whose outcome is uncertain, and that relate to environment which is recognized as being particularly necessary to preserve due to the difficulty of its restoration (specifically, measures relating to habitat for rare plants and wildlife, measures necessary for the protection of rare plants and wildlife, and measures whose outcome is uncertain and that have been adopted when the environment in the surrounding area is

recognized as being particularly necessary to preserve due to the difficulty of its restoration), supplementary environmental mitigation measures adopted in accordance with the results of the follow-up survey, and the follow-up survey.

The matters recorded in the impact mitigation report are to be included in the draft statement and the impact statement, so the details and outcome of the environmental mitigation measures and the follow-up survey items or methods should be compiled unambiguously and residents informed at the earliest stage possible, and to ensure objectivity and transparency, expert advice should be obtained as necessary.

8.2 Time of preparing the impact mitigation report

In principle, the impact mitigation report is prepared once when construction has concluded, and is sent to the issuer of the licenses etc. and also released to the public. Some business types are approved as special cases; for example, power generation plants to which the provisions of the Electricity Business Act apply even after the implementation of the project are only required to publicly release the report.

Apart from preparing the impact mitigation report, the project proponent is required to publicly release the outcome of the environmental mitigation measures and the results of the follow-up survey during construction or after service commencement as necessary.

- Some environmental mitigation measures concerning plants and wildlife in particular may not have an immediate effect, so it is preferable that the impact mitigation report is prepared after the outcome of the measures has been confirmed.
- When releasing the results of the follow-up survey or environmental mitigation measures midway through the construction or at the service provision stage as a voluntary approach, consideration should be given so that the details released can be properly compared with the forecast results.

8.3 Matters to be recorded in the impact mitigation report

The Basic Matters stipulates the matters to be recorded in the impact mitigation reports as follows.

(1) The matters to be recorded in the impact mitigation report shall be as follows.
  (a) Name and address of the project proponent (if a corporation, the name of the corporation, name of the representative, and address of the main office), and basic information about the project, including name, type and scale of the project, and area where the project was implemented.
  (b) Follow-up survey items, methods and results.
  (c) Details, outcome, and level of uncertainty regarding the environmental mitigation measures.
  (d) If expert advice was received, the details of that advice.

(e) Statement to the effect that if surveys or environmental mitigation measures are to be conducted after the impact mitigation report has been prepared, such plans and results will be publicly released.

(2) When the project entity handed the project over to a separate entity during construction related to the project, or when the project entity is different from the management entity after service commencement, the method and details of the cooperation with the other entity or request to the other entity must be recorded in the impact mitigation report.

(Basic Matters; 6. Basic Matters Concerning Guidelines for Preparation of Impact Mitigation Reports. 2)

In principle, matters recorded in the impact mitigation report should be in line with the content of the environmental mitigation measures or follow-up survey plan recorded in the impact statement, but when the details recorded in the impact statement indicate that subsequent environmental mitigation measures or follow-up surveys are necessary, including the details established at the completion of construction, or results of environmental mitigation measures or follow-up surveys, the plan must be recorded as specifically as possible.

- When the project details indicated in the project plan recorded in the impact statement are different from the details actually implemented, the changed details and process must be recorded. Preventing or reducing the environmental impact caused by the project as much as possible by fully examining the extent of the environmental impact associated with this and reviewing the details of the environmental mitigation measures or follow-up survey as necessary is expected to lead to the appropriate environmental considerations.
- The impact mitigation report must show a comparison between the details and results of the follow-up survey and the results of the environmental impact assessment, and if there are differences, it is important to look at the causes of those differences. Moreover, when there is an addition to or change of follow-up survey items or methods after the publication of the impact statement, not just the details of the addition or change, but the examination process and reasons must also be recorded.
- Supplementary environmental mitigation measures adopted in accordance with the environmental conditions revealed by the follow-up survey must also be recorded in the impact mitigation report, and when there is an addition to or change of environmental mitigation measures after the publication of the impact statement, not just the details of the addition or change, but the examination process and reasons must also be recorded.
- The outcome of the environmental mitigation measures, including the confirmation status of the outcome of the measures after implementation, must be entered in the report.
- It is envisaged that expert advice will be obtained for setting the follow-up survey items and methods, judging completion, and reflecting these in the environmental mitigation measures, and in this case, the details of the expert advice and the specialization of the expert providing such advice must be recorded. Where possible, the organization with which the expert is affiliated should also be recorded.

- When conducting a follow-up survey or implementing environmental mitigation measures after preparing the impact mitigation report, the plan and the results must be publicly released, and future response guidelines based on the results of the follow-up survey already implemented must be recorded. It is also preferable that the method and time of the release is entered in the report.
- When conducting a follow-up survey after service commencement or when comprehending the environmental mitigation measures outcome after service commencement, if the project entity is different from the management entity during the service provision stage, a proper hand-over must be carried out.

8.4 Methods of publicly releasing the impact mitigation report

The impact mitigation report must be released in the area where the environmental impact assessment was announced and made available for public inspection, and must be available in written form for public display for an appropriate period with 30 days as a guide.

When publishing the report on the Internet, the report should be posted on the homepage on a continuous basis and in a way that allows the general public to readily access the information and knowledge relating to the outcome of the environmental mitigation measures and results of the follow-up survey. It is expected that the comparison between the forecast results and the follow-up survey results, and the accumulation of information on the outcome of environmental mitigation measures will contribute to improving environmental impact assessment techniques such as establishing appropriate survey methods and improving forecast techniques, and also establishing effective environmental mitigation measures.