**AFE BABALOLA UNIVERSITY**

**DEPARTMENT OF TOURISM AND EVENT MANAGEMENT**

**TEM 406: SITE SURVEYING AND SITE SELECTION**

**SITE SELECTION: MEANING AND SCOPE**

Many towns have suffered great environmental hazards due to lack of adequate consideration for site selection, effective site analysis and planning. These are the three basic steps in the production of an effective plan for any intended development.

The term site refers to a piece of land earmarked for a certain purpose or the scene of something. In physical planning, it is used for a space where a spatial activity is to be developed. In other words, it is a plot or parcel of land already used or earmarked for development.

Site selection is concerned with the choice of a site from amongst other options. This is done by considering certain factors which influence development of a particular spatial activity. The site with maximum benefits and minimum problems is usually selected for the project. Usually during selection, different alternative sites might be considered and the best alternative selected by scoring the different alternatives using two or more evaluation techniques. The site with the highest score is usually chosen for the project at hand.

In another vein, site selection could be based on screening. This is done by blocking off on an aerial map the area that in the light of stated objectives are unacceptable for such reasons as excessive grade or cost, poor soil, small size, previous development or lack of access.

Finally, when a site has been selected for an activity like residential, commercial or industrial development, certain analysis are carried out before the design on site or site planning is done. These stages are very vital for every case of land use development in order to ensure that a healthful and functional design is produced.

**FACTORS OF SITE SELECTION**

Many factors affect the selection of any site for particular development activities whether residential, commercial or industrial. Some of these factors include physical, socio-cultural, economic and political factors. Since each site has its unique features which should be found out before any development on site, it becomes imperative that the designer should take advantage of this uniqueness to enhance the quality of the project.

**PHYSICAL FACTORS**

Physical factors such as the topography of a site, good soil for agricultural activities, mineral deposits like limestone, coal or oil (which are natural factors on one hand) and street patterns, good roads, utilities and services (which are man-made factors) have considerable effect on site selection. They are the most important consideration in the location of facilities and other land uses on a site.

The topography of an area can favour or discourage the use of an area for certain activities. For example, a heavy industrial zone cannot be located on a sloppy or steep terrain. This is because industries require a large expanse of fairly flat terrain because of the type of vehicles required to service them in addition to area of land to be built up.

It is also not advisable for good soil which can be used for agricultural purposes to be used up for other land uses. Mineral deposits in an area might also influence the selection of a site; for instance siting a cement industry close to a limestone deposit.

Easy accessibility to a place due to type of street pattern and the availability of utilities and services also affect the selection of site for development activities.

In addition, areas endowed with beautiful landscape elements are also selected for certain purposes. Hotels and tourists centres are known to be attracted to areas endowed with some natural potential like rivers, valleys and lakes. Climatic factors like temperature, humidity and rainfall vary with different regions and can contribute to the beauty of an area. Therefore, in selecting a site for particular development purposes, areas of outstanding beauty can be considered.

**ECONOMIC FACTORS**

Economic factors play a major role in the selection of sites especially for industrial and commercial activities. These factors include availability of raw materials, easy access to the market or transportation, power, large expanse of land and other factors that can make production costs minimal, while maximizing profit. For instance, under competitive conditions, a producer normally selects a site for his industry at a place where cost of production is as low as those of his competitors.

In cases where raw materials are heavy or bulky in proportion to weight of finished products and therefore expensive to transport, nearness to source of raw materials can have a dominant influence on site selection. There is also need for easy means of transportation to carry manufactured goods to both near and distant markets. Spare parts should also be brought when there is a breakdown of machine.

Economic considerations for site selection sometimes lead to overconcentration of a particular activity in an area thus resulting in urban deterioration or other changes. The cost of procuring a site and for development must also be considered before its selection. A site could be cheaper to develop than another. A site that requires a major site work before it can be built upon might be too expensive to develop.

**SOCIO-CULTURAL FACTORS**

A site can be selected for a particular development because of socio-cultural facilities and amenities within and around it. For instance, social facilities like recreational, entertainment and community amenities attract people and industries to a particular location.

**POLITICAL FACTORS**

The government can for political reasons locate some land uses in a particular area. An area for instance can be uplifted to urban status or designated an industrial area. Political factors therefore play an important role in site selection.

**TECHNOLOGICAL FACTORS**

Technological factors can also contribute to the selection of a site for a particular development. This is because technology for instance provides greater choice in transportation and other services. An area which ordinarily would have been unfit for a particular land use could then be selected because of an alternative approach to the development as a result of improved technology.

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**SITE SURVEYING AND SURVEY TOOLS**

Site analysis is a very important aspect of site development. It is usually carried out on the basis of the purpose which the particular site is to serve. To do this therefore, site survey is first carried out in order to obtain necessary information on soil conditions, topography, slope, vegetation, drainage, climatic condition and hydrology before the analysis is done.

**SITE SURVEY**

The first step in site analysis is to carry out a preliminary survey of the site (preliminary reconnaissance) in which the planner watches out for the potentials and limitations of the site. A brief look could be taken at the history of the site and its former use through official sources as well as by consulting local inhabitants. Enquiries could also be made on what people think about the site, its image and what is expected from it.

Local planning authorities are required to prepare plans (structure and local plans) which should show how each area should be developed. These plans might be due for change or even be out of date. In any case, the planning officer should know the current situation and should therefore be in a position to advice whether or not the proposed development in the area will be acceptable.

Enquiries will be followed by a more detailed survey in which the planner considers the impact of the proposed development on the site and the environment. During this period, variety of maps is used to provide the basic description of the physical features and layout of the study area. They also provide the base for plotting and analysing the information collected during the survey, like the slope analysis, drainage analysis and soil analysis.

These reference maps used in land use survey include topographic maps, base maps, engineering maps, property maps and miscellaneous reference maps. Of all these, the most important for this discussion are the topographic, base maps, and location maps.

* **Topographic Maps**

These maps show the natural features of the study area. They high-light areas like the land forms by contour lines, rivers, streams, ponds and other features. Sometimes, they also show wooded areas and rock outcrops.

* **Base Maps**

Base maps are general purpose maps and are usually more commonly available because they are frequently published in large numbers by the government. The maps among other things show streets and their names, rail lines, lakes, rivers and major public buildings – and areas of historic significance. Sometimes base map covers the entire metropolitan area of interest making it possible for use in generalised studies.

* **Location Maps**

Location maps are related to base maps but sometimes for clarity purposes, it might become necessary in a development say in Enugu to narrow down for example from map of (Nigeria) to that of Enugu State before getting into the metropolitan area and finally to the site of the project. If time permits, the planner could visit the site or area. These findings will be useful during the development of the site.

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**SITE ANALYSIS**

**DATA ANALYSIS**

Existing environmental attributes of a site are usually the basic data input for environmental analysis. For the analysis therefore, data on various environmental conditions may be required.

* **Soil Condition**.

An extensive knowledge of on-site soil conditions is helpful both in determining the suitability of a site to support the buildings of roadways and in gaining an insight into existing plant communities and associated wild life habits.

In other words in-depth knowledge of soil characteristics will throw more light on the agricultural and landscaping potential of the site as well as give information on its erodability or capacity to retain water.

* **Topography, Slope and Physiography**

A knowledge of the topography/slope condition of a site helps to determine the best location of roadways and natural drainage direction. Besides, in landscaping, the configuration of the landmass is a visual and aesthetic resource that strongly influences the location of various land use and recreational functions. It also has some impact on the elevation, exposure and orientation to weather. Data on physiographic obstructions such as mountains, valleys, cliffs, ridges, which obstruct and are sometimes hazardous to certain development, are also used for environmental inventory

* **Vegetation**

Vegetation on a site and its distribution contribute to the visual, recreational and ecological value of a site. A clear knowledge of this is therefore imperative since it can help the planner to determine the suitability of the site for a particular development such as landscaping it for picnicking, parks, for cultivation or agricultural purposes or for wildlife habitation.

* **Hydrology**

This refers to the existence of surface water features such as streams, ponds, lakes, rivers, reservoirs, springs and wet lands. Sometimes this is a very important resource in the development of some land uses for instance industrial land use. It is therefore necessary to consider the capability of the hydrological system.

* **Climate**

Various climatological features such as temperature, precipitation and wind which affect site should be considered and analyzed. Experience has shown that climatic variations have seasonable effect on plants, land form and animal life. It is therefore necessary to analyze this so as to know the condition of the physical environment at each period of the yea

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**LAND: DEFINITION AND CHARACTERISTICS**

Land comprises the physical environment, including climate, relief, soils, hydrology and vegetation, to the extent that these influence potential for land use. It includes the results of past and present human activity, e.g. reclamation from the sea, vegetation clearance, and also adverse results

**Land uses**

The seven types of land uses are:   
1. Residential Land Use - where people live (houses, apartment buildings)   
2. Institutional Land Use - government related (schools, town hall, police station)   
3. Recreational Land Use - for fun, entertainment purposes (parks, bowling place)   
4. Open/ Vacant Space Land Use - empty land   
5. Commercial Land Use - places to do with [making] money (stores, banks)   
6. Industrial Land Use - working places that help industry (factories)   
7. Agricultural Land Use - land used to grow food etc. (farmland)   
8. Railway Land Use - railways   
9. Transportation Land Use -to do with transport (bus stops, roads)   
10. Government Land Use ] } like "institutional"   
11. Utilities Land Use - like hydroelectricity towers

**Multiple Land Uses**

**A multiple land utilization** type consists of more than one kind of use simultaneously undertaken on the same area of land, each use having its own inputs, requirements and produce. Example is a timber plantation used simultaneously as a recreational area, or residential with commercial

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**WHAT IS LAND-USE PLANNING?**

There is bound to be conflict over land use. The demands for arable land, grazing, forestry, wildlife, tourism and urban development are greater than the land resources available. In the developing countries, these demands become more pressing every year. The population dependent on the land for food, fuel and employment will double within the next 25 to 50 years. Even where land is still plentiful, many people may have inadequate access to land or to the benefits from its use. In the face of scarcity, the degradation of farmland, forest or water resources may be clear for all to see but individual land users lack the incentive or resources to stop it.

Land-use planning is the systematic assessment of land and water potential, alternatives for land use and economic and social conditions in order to select and adopt the best land-use options. Its purpose is to select and put into practice those land uses that will best meet the needs of the people while safeguarding resources for the future. The driving force in planning is the need for change, the need for improved management or the need for a quite different pattern of land use dictated by changing circumstances.

Planning also provides guidance in cases of conflict between rural land use and urban or industrial expansion, by indicating which areas of land are most valuable under rural use.

**When is land-use planning useful?**

Two conditions must be met if planning is to be useful:

• the need for changes in land use, or action to prevent some unwanted change, must be accepted by the people involved;

• there must be the political will and ability to put the plan into effect.

Where these conditions are not met, and yet problems are pressing, it may be appropriate to mount an awareness campaign or set up demonstration areas with the aim of creating the conditions necessary for effective planning.

**Making the best use of limited res ources**

Our basic needs of food, water, fuel, clothing and shelter must be met from the land, which is in limited supply. As population and aspirations increase, so land becomes an increasingly scarce resource.

Land must change to meet new demands yet change brings new conflicts between competing uses of the land and between the interests of individual land users and the common good. Land taken for towns and industry is no longer available for farming; likewise, the development of new farmland competes with forestry, water supplies and wildlife.

Planning to make the best use of land is not a new idea. Over the years, farmers have made plans season after season, deciding what to grow and where to grow it. Their decisions have been made according to their own needs, their knowledge of the land and the technology, labour and capital available. As the size of the area, the number of people involved and the complexity of the problems increase, so does the need for information and rigorous methods of analysis and planning. However, land-use planning is not just farm planning on a different scale; it has a further dimension, namely the interest of the whole community.

Planning involves anticipation of the need for change as well as reactions to it. Its objectives are set by social or political imperatives and must take account of the existing situation. In many places, the existing situation cannot continue because the land itself is being degraded. Examples of unwise land use include: the clearance of forest on steep lands or on poor soils for which sustainable systems of farming have not been developed; overgrazing of pastures; and industrial, agricultural and urban activities that produce pollution. Degradation of land resources may be attributed to greed, ignorance, uncertainty or lack of an alternative but, essentially, it is a consequence of using land today without investing in tomorrow.

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**THE GOAL OF LAND USE PLANNING IN RELATION TO SITE SELECTION**

Land-use planning aims to make the best use of limited resources. This principle should be strictly considered before a suitable land is selected for specific development. This is achieved by:

* assessing present and future needs and systematically evaluating the land's ability to supply them;
* identifying and resolving conflicts between competing uses, between the needs of individuals and those of the community, and between the needs of the present generation and those of future generations;
* seeking sustainable options and choosing those that best meet identified needs;
* planning to bring about desired changes;
* learning from experience.

There can be no blueprint for change. The whole process of planning is iterative and continuous. At every stage, as better information is obtained, a plan may have to be changed to take account of it.

**GOALS**

Goals define what is meant by the "best" use of the land. They should be specified at the outset of a particular planning project. Goals may be grouped under the three headings of efficiency, equity and acceptability and sustainability.

***Efficiency.*** Land use must be economically viable, so one goal of development planning is to make efficient and productive use of the land. For any particular land use, certain areas are better suited than others. Efficiency is achieved by matching different land uses with the areas that will yield the greatest benefits at the least cost.

Efficiency means different things to different people, however. To the individual land user, it means the greatest return on capital and labour invested or the greatest benefit from the area available. Government objectives are more complex: they may include improving the foreign exchange situation by producing for export or for import substitution.

***Equity and Acceptability.*** Land use must also be socially acceptable. Goals include food security, employment and security of income in rural areas. Land improvements and redistribution of land may be undertaken to reduce inequality or, alternatively, to attack absolute poverty.

One way of doing this is to set a threshold standard of living to which those of target groups should be raised. Living standards may include levels of income, nutrition, food security and housing. Planning to achieve these standards then involves the allocation of land for specific uses as well as the allocation of financial and other resources.

***Sustainability.*** Sustainable land use is that which meets the needs of the present while, at the same time, conserving resources for future generations. This requires a combination of production and conservation: the production of the goods needed by people now, combined with the conservation of the natural resources on which that production depends so as to ensure continued production in the future.

A community that destroys its land forfeits its future. Land use has to be planned for the community as a whole because the conservation of soil, water and other land resources is often beyond the means of individual land users.

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**THE FOCUS OF LAND-USE PLANNING**

**Planning is for People**

People's needs drive the planning process. Local farmers, other land users and the wider community who depend on the land must accept the need for a change in land use, as they will have to live with its results.

Land-use planning must be positive. The planning team must find out about people's needs and also the local knowledge, skills, labour and capital that they can contribute. It must study the problems of existing land-use practices and seek alternatives while drawing the public's attention to the hazards of continuing with present practices and to the opportunities for change.

Regulations to prevent people doing what they now do for pressing reasons are bound to fail. Local acceptability is most readily achieved by local participation in planning. The support of local leaders is essential while the participation of agencies that have the resources to implement the plan is also important.

**Land is Not the Same Everywhere**

Land is, self-evidently, the other focus of land-use planning. Capital, labour, management skills and technology can be moved to where they are needed. Land cannot be moved, and different areas present different opportunities and different management problems. Nor are land resources unchanging: this is obvious in the case of climate and vegetation, but examples such as the depletion of water resources or the loss of soil by erosion or salinity are reminders that resources can be degraded, in some cases irreversibly. Good information about land resources is thus essential to land-use planning.

**Knowledge of Land Use Technology**

A third element in planning is knowledge of land-use technologies: agronomy, silviculture, livestock husbandry and other means by which land is used. The technologies recommended must be those for which users have the capital, skills and other necessary resources; that is, appropriate technology. New technologies may have social and environmental implications that should be addressed by the planner.

**Integration of Land Uses**

A mistake in early attempts at land-use planning was to focus too narrowly on land resources without enough thought given to how they might be used. Good agricultural land is usually also suitable for other competing uses. Land-use decisions are not made just on the basis of land suitability but also according to the demand for products and the extent to which the use of a particular area is critical for a particular purpose.

Planning has to integrate information about the suitability of the land, the demands for alternative products or uses and the opportunities for satisfying those demands on the available land, now and in the future.

Therefore, land-use planning is not sectoral. Even where a particular plan is focused on one sector, e.g. smallholder tea development or irrigation, an integrated approach has to be carried down the line from strategic planning at the national level to the details of individual projects and programmes at district and local levels.

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**Overview of the planning process**

Every land-use planning project is different. Objectives and local circumstances are extremely varied, so each plan will require a different treatment. However, a sequence of ten steps has been found useful as a guide. Each step represents a specific activity, or set of activities, and their outputs provide information for subsequent steps.

***Step 1: Establish goals and terms of reference.*** Ascertain the present situation; find out the needs of the people and of the government; decide on the land area to be covered; agree on the broad goals and specific objectives of the plan; settle the terms of reference for the plan.

***Step 2: Organize the work.*** Decide what needs to be done; identify the activities needed and select the planning team; draw up a schedule of activities and outputs; ensure that everyone who may be affected by the plan, or will contribute to it, is consulted.

***Step 3: Analyse the problems.*** Study the existing land-use situation, including in the field; talk to the land users and find out their needs and views; identify the problems and analyse their causes; identify constraints to change.

***Step 4: Identify opportunities for charge.*** Identify and draft a design for a range of land-use types that might achieve the goals of the plan; present these options for public discussion.

***Step 5: Evaluate land suitability.*** For each promising land-use type, establish the land requirements and match these with the properties of the land to establish physical land suitability.

***Step 6: Appraise the alternatives: environmental, economic and social analysis.*** For each physically suitable combination of land use and land, assess the environmental, economic and social impacts, for the land users and for the community as a whole. List the consequences, favourable and unfavourable, of alternative courses of action.

***Step 7: Choose the best option.*** Hold public and executive discussions of the viable options and their consequences. Based on these discussions and the above appraisal, decide which changes in land use should be made or worked towards.

***Step 8: Prepare the land-use plan.*** Make allocations or recommendations of the selected land uses for the chosen areas of land; make plans for appropriate land management; plan how the selected improvements are to be brought about and how the plan is to be put into practice; draw up policy guidelines, prepare a budget and draft any necessary legislation; involve decision-makers, sectoral agencies and land users.

***Step 9: Implement the plan***. Either directly within the planning process or, more likely, as a separate development project, put the plan into action; the planning team should work in conjunction with the implementing agencies.

***Step 10: Monitor and revise the plan.*** Monitor the progress of the plan towards its goals; modify or revise the plan in the light of experience.

**In a still broader view, the steps can be grouped into the following logical sequence:**

**• Identify the problems- *Steps 1-3*.  
• Determine what alternative solutions exist- *Steps 4-6*.  
• Decide which is the best alternative and prepare the plan- *Steps 7-8*.  
• Put the plan into action, see how it works and learn from this experience- *Steps 9-10*.**

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**Basic information about the area**

To get started, the planning team will need some basic information about the land, the people and the organization of administration and services. The planner must find out what is available and where to get it, and must identify the people who can serve as contacts between the planning team, specialist agencies and the local community. The planner must also find out which essential data are not available, so that surveys can be scheduled and cost. The range of information and amount of detail needed will vary according to the level of planning. Following are examples of information that may be required:

• ***Land resources***. Climate, hydrology, geology, landforms, soils, vegetation (including forest and pasture resources), fauna, pests and diseases. Sources include topographic base maps, air photographs and satellite imagery, existing surveys and departmental records. (See Natural resource surveys,

**• *Present land use***. Surveys and departmental records of land use, farming systems, forestry, production levels and trends.

**• *Present infrastructure***. Transport, communication and services to agriculture, livestock management and forestry.

**• *Population***. Numbers, demographic trends, location of settlements, the role of women, ethnic groups, class structure, leadership.

**• *Land tenure***. Legal and traditional ownership and user rights for land, trees and grazing; forest reserves, national parks.

• ***Social structure and traditional practices***. Land use is tied up with the history and culture of the people and has usually evolved over a long period. Understanding the present situation is a prerequisite for devising improvements.

• ***Government*.** Administrative structure and key authorities; services provided and demands placed upon them. Ask representatives of the various agencies active in the area to brief the planning team.

**• *Legislation***. Laws and regulations that affect land use; traditional law and custom; whether laws are enforced.

**• *Non-governmental organizations (NGOs)*.** Find out about NGOs in the planning area, for example farming and marketing cooperatives that may have roles in planning or implementing a land-use plan.

• ***Commercial organizations***. Contact any commercial organizations, e.g. mining companies, whose interests may be affected.

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**SURVEYING/LAND SURVEYING –Definition and Scope**

**Surveying** or **land surveying** is the technique, profession, and science of accurately determining the terrestrial or dimensional position of points and the distances and angles between them. These points are usually on the surface of the [Earth](http://en.wikipedia.org/wiki/Earth), and they are often used to establish land [maps](http://en.wikipedia.org/wiki/Maps) and boundaries for [ownership](http://en.wikipedia.org/wiki/Ownership) or governmental purposes.

An alternative definition by the [American Congress on Surveying and Mapping](http://en.wikipedia.org/wiki/American_Congress_on_Surveying_and_Mapping) (ACSM) is the science and art of making all essential measurements to determine the relative position of points or physical and cultural details above, on, or beneath the surface of the Earth, and to depict them in a usable form, or to establish the position of points or details.

Furthermore, as discussed above, a particular type of surveying known as **"land surveying"** is the detailed study or inspection, as by gathering information through observations, measurements in the field, questionnaires, or research of legal instruments, and data analysis in the support of planning, designing, and establishing of property boundaries. It involves the re-establishment of land boundaries based on documents of record and historical evidence, as well as certifying surveys (as required by statute or local ordinance) of subdivision plats/maps.

**Land surveying** can include associated services such as mapping and related data accumulation, construction layout surveys, precision measurements of length, angle, elevation, area, and volume, as well as horizontal and vertical surveys, and the analysis and utilization of land survey data.

Surveying has been an essential element in the development of the human environment since the beginning of recorded history (about 5,000 years ago). It is required in the planning and execution of nearly every form of [construction](http://en.wikipedia.org/wiki/Construction). It’s most familiar modern uses are in the fields of [transport](http://en.wikipedia.org/wiki/Transport), [building](http://en.wikipedia.org/wiki/Building) and construction, [communications](http://en.wikipedia.org/wiki/Communication), mapping, and the definition of legal boundaries for land ownership.

**HOW TO READ LAND SURVEY DOCUMENTS**

Before buying or selling a piece of land, a survey determines the exact boundaries of the land based on legal documents filed about the particular piece of property. The surveyor creates land survey documents during the process, which legally describe the property, covering everything from property lines to waterways. Being able to read these land survey documents ensures that as a buyer or seller, you know precisely what the property contains--reducing any chances of misunderstandings with other parties involved in a land transaction, or owners of neighboring property.

**Step 1**

Examine the land transfer document and the title insurance commitment document to get a precise description of the property.

**Step 2**

Locate the property on the landuse map or the description provided. Along with location, the description should include any information about whether the property is within a subdivision, and if so, both the lot name and the subdivision name must be included.

**Step 3**

Find the basic map information located on the borders of the survey map. Look for a directional pointer, usually indicated by an arrow pointed to the top of the map showing north. Note the scale of the survey, telling you the scale of the map. Use a ruler to measure distances on the map, and convert those measurements using the map scale to determine actual distances between points on the property.

**Step 4**

Study the survey legend, typically located along the bottom of the map. Each symbol in the legend has a label and denotes a specific topographical feature on the map. Match the symbols on the legend with the symbols on the map to determine which features are present on the property.

**Step 5**

Locate any third-party claims on the map. These should be clearly marked as to the type of claim--for example, an easement that gives the right to use that portion of the property to a third party.

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**SURVEYING TECHNIQUES**

Historically, [distances](http://en.wikipedia.org/wiki/Distance) were measured using a variety of means, such as with chains having links of a known length, for instance a [Gunter's chain](http://en.wikipedia.org/wiki/Gunter%27s_chain), or measuring tapes made of [steel](http://en.wikipedia.org/wiki/Steel) or [invar](http://en.wikipedia.org/wiki/Invar) to measure horizontal distances. In instances of measuring up a slope, the surveyor might have to "break" (break chain) the measurement.

Historically, horizontal angles were measured using a [compass](http://en.wikipedia.org/wiki/Compass), which would provide a magnetic bearing, from which deflections could be measured. This type of instrument was later improved, with more carefully scribed discs providing better angular resolution, as well as through mounting telescopes.

A more modern instrument is a [total station](http://en.wikipedia.org/wiki/Total_station), which is a **Theodolite** with an electronic distance measurement device (EDM). Since its introduction, total stations have made the technological shift from being optical-mechanical devices to being fully electronic.

The simplest method for measuring height is with an [**altimeter**](http://en.wikipedia.org/wiki/Altimeter)— basically a [barometer](http://en.wikipedia.org/wiki/Barometer) — using air pressure as an indication of height. But surveying requires greater precision. A variety of means, such as precise levels (also known as differential levelling), have been developed to do this. With precise levelling, a series of measurements between two points are taken using an instrument and a measuring rod. Differentials in height between the measurements are added and subtracted in a series to derive the net difference in elevation between the two endpoints of the series.

With the advent of the [**Global Positioning System**](http://en.wikipedia.org/wiki/Global_Positioning_System) **(GPS)**, elevation can also be derived with sophisticated satellite receivers, but usually with somewhat more accuracy than with traditional precise leveling especially when the traditional levelling would have to be run over a long distance.

**METHOD OF MEASUREMENTS**

[**Triangulation**](http://en.wikipedia.org/wiki/Triangulation) is another method of horizontal location made almost obsolete by GPS. With the triangulation method, distances, elevations and directions between objects at great distance from one another can be determined. Since the early days of surveying, this was the primary method of determining accurate positions of objects for [topographic](http://en.wikipedia.org/wiki/Topographic) maps of large areas. A surveyor first needs to know the horizontal distance between two of the objects. Then the height, distances and angular position of other objects can be derived, as long as they are visible from one of the original objects. High-accuracy transits or theodolites were used for this work, and angles between objects were measured repeatedly for increased accuracy.

**Turning** is a term used when referring to moving the level to take an elevation shot in a different location. During land surveying, there may be trees or other obstructions blocking the view from the level gun to the level rod. Turning is not only used when there are obstructions in the way, but also when drastically changing elevations.

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**DEPARTMENT OF TOURISM AND EVENT MANAGEMENT**

**TEM406: SITE SURVEYING AND SITE SELECTION**

**IMPORTANCE OF SITE SELECTION CRITERIA FOR TOURISM PROJECTS**

(i) To represent a masterpiece of human creative genius; attaining the goal of the best project for the best site

(ii) To exhibit and maximize the use of available resources- natural and man-made within the chosen site and its environment

(iii) To bear a unique identity in the proposed location, thereby enjoying full monopoly, patronage and recognition

(iv) To be located where the proposed tourism project will enjoy full acceptance and support, especially by the local people.

(v) To be able to blend with the traditional human settlement, land-use, or sea-use e.t.c, that may available around the proposed project environment, to avoid crisis and chaos.

(vi) To be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of the host communities.

(vii) To enhance superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.

(viii) To reflect a representation of suitable landforms, or significant geomorphic or physiographic features that will facilitate the sustainability of the proposed tourism site

(ix) To be cordial and dependable relationships between the tourism site and existing or on-going ecological and biological processes such as terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.

(x) To establish an accessible and efficient transportation network that will connect the proposed site and the would-be customers or visitors to the site.