

Chapter 1

Historical background

History of engineering practice

Engineers are the men who down the long centuries have learned to exploit the properties of matters and sources of power for the benefits of mankind. The civilization as we know today owes its existence to the engineers. By organized, rational efforts to use the materials world around them, engineers devised the myriad comforts and conveniences that mark the differences between our lives and those of our forefathers thousands of years ago.

Engineers work in the society and the society if populations. Therefore, one should understand society and its components. Society is a population that occupies a certain territory that is subject to the same political authority and the participate in a common culture. So, a society has the following criteria: -

1. It has a populations,
2. The population must occupy a common territory,
3. The population must share the same government or political authority and
4. The population must, to some extent, have a common culture and a sense of relationship/membership in and commitment to the same group.

Beyond these criteria, a society has the following essential elements, without which it does not form society: -

1. **Plurality:**

A society must have populations composed of all ages, sexes and groups of various economic statuses.

2. **Stability:**

A society is of a permanent character. Social life is organized mainly on the basis of division of labor.

3. **Likeness:**

In society, the populations have some significantly alike in some ways. In earlier times, blood relationship was considered likeness to recognize the member of the population or society, these days; it is recognized by the Nationality.

4. **Differences:**

A society must have differences in its population – interest, ages, sexes, opinions, intellectuality etc so that the society is complete in it by itself.

5. **Interdependences:**

Populations of a group that forms a society are often dependent on each other. When a child takes birth, its mothers must be taking care of it till it becomes able to feed itself. A member of a society must need cooperation for survival.

6. Cooperation:

In human society, cooperation is a must, otherwise human society could have vanished along ago on the earth, simply because, mankind are physically weaker, more frail in comparison to other powerful animals. Population must have a feeling and behavior of cooperation. A sense of confidence to get help from other population members.

The human societies in the world have been broadly divided in two, as following on the bases of its beginning, composition and values and cultures.

- a. Eastern Societies
- b. Western Societies

The values accorded by the culture to the individual and groups in the eastern societies are to the achieve high mortality, power of truth, and achievement in religious activities. They, who have achieved those, are regarded higher than those acquiring materialistic and physical objects. The Saint, Mahatma, Sadhu are the examples.

In the western societies, the following values are regarded as the success in lives:

- Achievement and success
- Activity and work
- Moral orientation
- Efficiency and practicability
- Progress
- Material comforts
- Equality
- Freedom
- Use of technology
- Individualistic
- High concern over time

Engineering practices in earlier days in the world can only be traced from dusty manuscript, and crumbling relics, explains as well the state of the world today as all the accounts of kings and philosophers, generals and politicians.

Civilization has arisen only when men discovered how to raise crops and tame animals about 10,000 years ago. The revolution seems first taken place in the hills that curve around to the north of Iraq and Syria. From Iraq and Syria, agriculture revolution quickly spread to the valley of the north and Indus, which in their turn become centers of cultural radiations.

Agricultural revolution brought about changes fully. In 3000 to 40000 years, some of the following villages of the near and middle East grew into cities. Then with a rush came metals writings, large scale government, science and other features of civilization.

When farmers learned to raise more foods then they themselves needed, other men were able to spend their times in making useful things, which they exchanged for surplus food, this way specializations arose.

Human societies had long known a couple of specialists: the tribal priest or wizard and the tribal chief or war leader. Later the tribal chief converted into king and the wizard into high priest. They waxed rich and powerful.

Wealth and experiences piled up. Men undertook projects too large for a single craftsman, even with the help of his sons and apprentices. Those projects called for the work of hundred or even thousands of men, organized and directed towards a common goal. Hence arose a new class of men- the technicians and engineers. The technicians and engineers could negotiate with the king or priesthood for building a public work plans the details and directing the workmen.

They combined practical experiences with knowledge of general, theoretical principles. Sometimes they were inventors, as well as contractors, designers and foremen. But all were men who could imagine something new and transfer a mental picture into physical reality.

The mere fact of having large interconnected populations, thus meant that inventions took place at faster rate than before, those inventions in turn made denser and more widely interconnected population possible. Moreover, the inventions on which civilization was founded tended and spread. These inventions did not spread out evenly in all directions. They spread along trade route, and they spread to lands where these ideas could be profitably applied. Natural barriers such as deserts and oceans stopped the spread: and they died out where conditions made them useless.

Civilization failed to penetrate the Negro-Africa being stopped by the barrier of the Sahara desert, the swamps of the White Nile, and the mountains of Abyssinia. Similarly, old world civilization failed to leap the watery barriers to reach the Pacific Islands, Australia, or the Americas. In another millennium, however the people of Central and South America began independently to develop their own civilizations.

The first engineers were Irrigators, Architects and Military Engineers. The same men were expected to be an expert at all three kinds of works. The Babylonian Gugallu or irrigation inspectors were such an expert.

Soon the kings who ruled cities desired houses larger and more comfortable than the huts of stones, clay and reeds wherein they had been living. So, they called upon Architects to build those Palaces.

Next, the priests insisted that the gods could be offended as they were not housed at least as splendid as the kings. So, the architects put up temples, containing statues of the gods and other arts of work.

To protect the wealth of the gods and the kings, military engineers built walls and dug moats around cities. Where stones were not available, bricks were used.

Before mortar was invented, buildings were built with small pieces, which would stand up to the weather for years. However, as an enemy had to do to such a wall was to pry out a few stones with his spear, and the wall collapsed. So, walls were built using very large stone, trimmed roughly to fit together.

The Greeks put their experiences down in writing and because good men had saved a small part of their writings for us, we know quite a lot about Greek and Roman engineering, but very little about ancient Iranians, Indians and Chinese engineering.

In time, the march of technology made the city- state obsolete. Where a river system forms a single large watershed, an irrigation system works better when it is ruled by one central administration. Thus, in the valley of Nile, the Tigris and Euphrates, the Indus and the Hwang-Ho, conditions favored the extension of one state's rule over all the others in the watershed.

Historians argue whether empire came first and made possible large-scale irrigation or whether large-scale irrigation come first and encouraged the growth of empire.

In the large watersheds of wet countries, such as the valley of the Gangas and the Mekong, irrigation was less important. But here the need to protect the valley dwellers from flood promoted the centralization of the government.

German-American scholar refers to a watershed empire as a "Hydraulic State".

In ancient empires, plenty of revolts, revolutions and civil wars were frequent. It was a rare king whose death did not result in a war among his would-be successors and provinces that had once separate nation repeatedly sought to remain their independence.

Sometimes Watershed Empire broke up into parts as a result of domestic disorder as foreign conquer, but after a few decades of joys and sorrows of anarchy and incessant strife, the people of watershed were once more prepared to submit to the rule of an all powerful emperor.

From the rise of the first watershed empires down to the achievement to temporary world mastery by Emperor after 1600 AD, men's history largely consists of the story of the mighty empires that rose in the main civilized belt, spread far beyond the confine of a single watershed flourished for a time, and withered away.

Thus, the Assyrian Empire gave away to the Median, and that to the Persians and that to the Macedonian, and the Turkish. A long succession of the other empires, in Iran, India, China, and central Asia, flourished beside their westerly realms. And many of the rulers of three domains, however, good or bad in other respects were among the world's greatest builder of public works and therefore the greatest patrons of the engineering professions.

For whatever their sins and oppressions, some early despots did much those they ruled. A king with any brains tried to make his people prosper, if only so that he can tax them.

Rulers of ancient empire built roads, which fastened commerce and communication, although the principal purpose of those roads were as of the governmental postal system that operated over them, was to keep a swift stream of commands and inquiries flowing out from the capital and flowing back, for the benefits of the rulers. However they might disagree on other matters, a king and his subjects had a common interest in keeping up roads, and canals, supporting brigandage and piracy and maintaining orders.

1.1 History of engineering practice in eastern society

Engineering practices in eastern societies can be with significant events as follows.

1. During 5000 BC, civilization developed near Yanshao, where people roamed seeking new soil for animals and agriculture. People used earthen pottery and stone tools.
2. During 4000 BC, early Chinese communities planned cities according to Grid pattern with intersecting streets at right angles to each other.
3. During 3300 – 3200 BC, Egyptians first developed a system of Division of Labor on closed societies in Sumar and Egypt, particularly among merchants and metal workers.
4. During 3500-3000 BC, in Sumeria, the appearance of towns and cities coincide with the production and distribution of goods through trades.
5. In 132 AD, Chinese philosopher Chang Heng invented a Seismoscope.
6. In 510 AD, China's Grand Canal (Shan-Yang) in southern China was built connecting Yangtze (Chang-Jiang) and Huang-He (yellow river), which played a lifeline for north China providing a transportation route for grains and commodities.
7. During 704 AD, the Buddhist text "**Dharani Sutra**" was printed in Korea during 704-751 AD, using block-printing technique. It is the oldest existing printed book.
8. In 805 AD, the forerunners of Gun were invented, which is called '**fire lance**', early models consisting of Roman Candles tied two spears, resembling flame throwers.
9. In 1040 AD, Chinese writer Tseng Kung – Liang published the first known Gun-powder formula for use in three weapons- a. Bomb held by a king of catapult, b. Bomb with hooks and c. Poison-smoke ball.
10. In 1045-1048 AD, Pi-Sang invented movable type of printing. Printing with movable type was developed in Europe in mid 15th century.
11. In 1250 AD, true guns with a gun powder chamber and strengthening explosion chamber to prevent splitting appeared in China. In less than a century, guns reached in Europe and changed to characters of medieval warfare.
12. In 1805 AD, Habaoka Seishu performed the first Surgery under a general anesthesia in Japan.
13. The Iranians built many bridges, however of which some survive from the time of Shapur-I (300 AD).
14. In 400 AD, the Sassaid kings built a great palace at Ctesiphon, which was a capital on Tigris, north east of deserted Babylon and downstream from the village of Baghdad. Part of this palace still stands, including most of the vaulted dining hall –“the widest single span vault of unreinforced brick work in the world.” The vault is 77 feet wide at the base and 112 feet high.
15. In 515 BC, Persian building method with stone instead of wood introduced in to India when Darius conquered the Punjab.

1.2 History of engineering practice in western society

Engineering practices in western societies can be traced out with significant events as follows.

1. In 3000-1000 BC, Stonehenge – a monument consisting of concentric circles of stone oriented towards the Sun position on the summer solstice in England.
2. In 300-100 AD, agriculture and power appeared in ancient Mesoamerica.

3. In 250-900 AD, Maya created and maintained a sophisticated pair of interlocking calendar to help them plan ceremonies.
4. In 1268 AD, English scientist and philosopher Roger Bacon records a statement about using lenses to improve vision with eyeglasses. At the end of 13th century, many wealthy and elite people in Europe, Asia, and Africa wear glasses.
5. In 1487 AD Aztec ruler Ahuizotl dedicated the new Templo Mayor (great temple), an enormous double pyramid in Tenochtitlan to the warrior God of the Sun.
6. In 1673 AD, English Mathematician, John Hadley and American inventor Thomas Godfrey independently invented the Sextant, an optical instrument to measure angular distance between any two objects.
7. In 1747-1752 AD, American Scientist Benjamin Franklin theorized that lightning is a form of electricity.
8. In 1780 AD, Scottish inventor James Watt and English manufacturer Matthew Boulton began manufacturing a steam engine for individual use.
9. In 1793 AD, American Eli Whitney invented the cotton gin, a device that rapidly and effectively removes the seeds from cotton fiber.
10. In 1807 AD, American inventor and engineer Robert Fulton inaugurated a new era of power driven navigation as a steamboat.
11. In 1660 AD, a fine opportunity for planned city was offered after a great fire of London by John Evelyn, the diarist and civil servant and Christopher Wren, an architect to Charles II for rebuilding the burnt city before the ashes cool down.
12. In 1548-1620, Simon Stevin discovered the triangle of forces in Netherlands, which helped to calculate the actual load on the members of cranes, trusses and other structures.
13. Stevin's younger contemporary Galileo Galilei in 1564-1642 AD, solved the problem of accelerated movement and began the analysis of stresses in beams.
14. Technical men organized the society of Lynxes to which Galileo belonged. The first research institute was founded in 1560 AD.
15. Engineering school appeared in France in 1800 AD and at the same time specialization within engineering profession took place. John Smeaton, who went to France in 1750's AD to round off his technical education, called himself 'Civil engineer' meaning non-military engineer.

1.3 Key roles of engineering in the developmental activities

History tells us that engineers are the people who exploit the properties of matters and sources of power for the benefits of the mankind. From this it is known that this roles played from ancient time by engineers are innovating the properties of matters, utilize them for the benefits of the people, and preserve the same for longer use. Similarly they seek sources of power so that power can be used in the welfare of people. Therefore, the major roles played by engineers in developmental activities are –

1. Creating vision: Imagine a useful and beneficial object or product that can be produced by utilizing the properties of different matters and sources of power for the benefits of the people.
2. Preparing mission: Plan, prepare and produce the same economically for the use of larger number of people for safe, healthy and protection.
3. Execution: Assign the planned activities and or get assigned the jobs that require engineering skills and knowledge for implementation.

4. Monitor and evaluate: Monitor and evaluate and supervise the make for accuracy, timely, quality and economical products.
5. Train: Train new engineers practically, technically and professionally to make professionals.
6. Upgrade profession: Innovate, systematize and produce or make facilities for the people by keeping up the dignity and ethical values of engineers.

With these basic roles of engineers in development activities, the impact left over in societies is changed societies. We can notice those impacts in the societies that the people utilizing them and make their lives more and better comfort ever then before. The changes brought by the engineers' activities in the human societies are as below: -

- a. Mass production of goods though machines
- b. Automation
- c. Faster means of transportation
- d. Mass communication
- e. Inventing labor saving devices
- f. Creating faster pace of life
- g. Commercializing recreation
- h. Emphasizing on high degree of specialization

With these impacts, the different forms of societies have shown clear and distinct changes in them, that we can observe as below: -

A. At family level of society:

Some positive changes:

- Nuclear family emerged
- Women started involving in male dominant working areas
- Changed living standard of life
- Children started new ways in specialization
- Started bringing changes orthodox values

Some Demerits

- Life became mechanical
- Relationship among keen relatives become formal
- Existing social customs changed
- Family ties among family member became less

B. In religion societies:

- Started analyzing religion doctrines and tradition
- Relaxation occurred in the rigidity of caste system
- People became free from religious rituals
- Religion became secondary thing.

C. In rural societies:

- Population started migrating towards urban areas
- Populations became increasingly consciousness of their societies
- People started changed farming techniques
- People have more comfortable lives than before
- Their life patterns changed

D. In urban societies:

- Shortage of land and space for living
- Rapid increasing in population and slums
- Transportation problem occurred
- Crimes increased
- Life became expensive
- Money became the most important thing in life

1.4 Individual freedom vs. societal goals

If you live by yourself on an island, you have only yourself to consider. When you band together with other people, however, your actions can affect the group of which you are a part.

Throughout the history, the group has attempted to set limits on the behaviors of individuals in the perceived best interest of the group and or even individuals. Group living always involved a compromise between individual freedom and protecting the best interests of the groups. So, how an individual's freedom can best be protected against the interest of the society is the concern. This concern has long been dealt with the study of Ethics. The study of Ethics is the study of "how to live in group".

Ethics is normative science of conduct, and the conduct is collective name for voluntary actions of individuals. So, ethics is the science of disciplined dealings with what is good and bad and with moral duties and obligations towards the societies.

Individuals interests contrasting with social interests creates dilemma, a confusion of which is right and wrong. Ethics deals with the norms about how one should behave in such dilemmas of right and wrong, good and bad and fair and unfair.

An individual freedom facing dilemmas can be assured by the following analysis: -

- a. Economical analysis
- b. Legal analysis and
- c. Philosophical analysis

The societal goal is to maintain and keep up morality in the society. In the most places, unwritten tribal customs have been supplanted by written codes of behaviors.

The early Greek attempted to understand the meaning of life and considered by many to have began the development of a Reasoned Philosophy of Ethics. The teachings of Socrates, Plato and Aristotle culminated in Nichomachus Ethics, named after the name of Aristotle's son – Nichomachus.

Aristotle debated at the length the meaning of the word 'Good' as well as the concept of 'Justice and happiness'.

The stoics attempted to formalize an ethical philosophy consistent with nature and with the God. The philosophy of Zeno urged that people apply rational control over those things within their sphere of control; one's highest purpose was the use of god given ability to reason. The stoics considered all people to be brothers and sisters and this developed a sense of social responsibility. Hedonistic and Utilitarian philosophy of ethics also developed in pre-Christian time. One of the earliest was that of Epicurus in Greece three centuries before the Christ. His philosophy stressed the pleasure of simple life; healthy and friendship etc.

In 18th century AD, Jeremy Bentham extended the earlier individualistic utilitarian philosophy to include the concern of group welfare. His philosophy held that an act should be judged with respect to its bringing about the greatest happiness for the greatest number.

In 19th century, Henry Sidgwick extended Utilitarian theory with maxim of Justice, prudence and benevolence. His maxim of justice commonly believed today is that what is right for one person should be right for all people and vice versa.

Immanuel Kant is most commonly identified with the theory of 'Formalism', which judges the good of an act on the basis of motive. In contrast, teleological theory judges an act on the basis of ultimate value of the outcomes.

Case: - Assume for the moment that you meet a very thirsty person in desert whom you give a drink of water from your canteen. What if the thermal shock of cold water kills that person?

Formalistic theory would exonerate you for trying, whereas teleological theory would condemn you for contributing to the person's death.

Chapter – 2 **Engineering Professionalism**

2.1 Engineering morals, ethics and professionalism

Morals measure the standard of good behavior by which people are judged. Engineering morals mean the standard of good behavior of engineering people by which they are judged. In moral quality, rightness or wrong are present. Non-moral means devoid of moral quality. All actions are non objects of moral judgment. Only voluntary and rational people are the objects of moral judgments.

The actions like nature or animals are not moral actions, even if the actions are good for human, because they are devoid of response to human life. Therefore, it should be human behavior concern for moral actions.

Ethics is a system of belief that supports the view of morality. Morality concerns with the principle of what is good and bad, right or wrong behaviors. Engineering morals measure the standard of good behaviors of engineers. As engineering people are the people to work for the benefits of mankind by exploiting the properties of matter and sources of power, they can come across moral dilemma in various stages of works. The interest and will of the people in the society may differ mainly because of seeking more benefits or return on behalf of them alone. They start then influencing the engineering people and the conscience of engineers' come across moral dilemmas. The engineers need to overcome the dilemma considering various laws of ethics as described under: -

a. Eternal law of ethics

The external law of moral is the set of standards of goods behaviors based on the nature and the scriptures. Studying the nature and scriptures, common sets of moral standards are set. The set of morals standards should be obvious to anyone who takes time to study the nature of scriptures. Everyone should act in accordance with the common set of standards. These laws are general rules or principles. "Do unto others as you would have others do unto you" is an example.

b. Utilitarian law of ethics

The professional or individuals should act in the way to creating the greatest benefits for the largest numbers of people. It is based upon the outcomes or results of the act. This law of ethics arose from the teleology theory. In Greek, 'teleo' means outcome or result. So a person should be aware of his or her act for its results or outcomes.

c. Universalism law of ethics

This law of ethics is based upon the motive or intent of the doers. It states that the professionals must have good motives behind their doings. This law comes from 'Deontological theory', wherein 'Deon' in Greek means duties and obligations. A professional as an engineer, have duties and obligations towards the societies they live in.

d. Distributive justice law of ethics

This law is based upon the primacy of justice equal to all. Rules and laws apply to all people. The professionals must have back in the mind that the law applies equally to all. The outgrowth of equality today is the result of this law.

e. Personal liberty law of ethics

This law of ethics is based upon the primacy of personal liberty. This law states that any act that violates anybody's personal liberty even if the act creates greater benefits for the larger number of people is not accepted. Any action of professional or individual must not violate anybody's liberty at all.

A profession is defined as having a systematic knowledge acquired through specialized training or education and practicing the same as an occupation. Besides these, professionals bear morals and ethical behaviors. The content of profession with moral and ethical behaviors is professionalism.

A professional helps in providing specialized work of service to the societies. The following are the some of the features of a profession –

1. A professional acquires a systematic knowledge and enhance skill
2. A professional exercises the knowledge and enhance skill ethically as an expert, occupational or professional
3. The service or works as an expertise of a professional is evaluated by the public
4. Professionals follow code of conducts to keep moral of the profession high
5. Professionals have their own cultures

In societies, some of the professions are found losing professionalism because of the following cause:

- a. Inadequate salary
- b. Defective social norms or value
- c. Low moral of the individual
- d. Non-regularities of law and regulations
- e. Lack of political commitment

2.2 Code of ethics and guidelines for engineering profession

The ethics as normative science of any professional conduct needs Codes of ethics and guidelines to maintain high level of standards of good behavior or conduct in the public. Engineers create facilities and services by any or all of the acts- designing, composing, evaluating, advising, reporting, directing, and supervising wherein the safeguard of life, health and property or the public welfare is concerned. Engineers do so by applying engineering principles and the experiences gained. The National Society of Professional Engineers (NSPE), U.S. approved by the Board of Directors on 5th Oct. 1977 has set the fundamental principles for engineers to uphold and advance the integrity, honor and dignity of engineering profession by: -

1. Using their knowledge and skill for the advancement of human welfare.
2. Being honest and impartial and serving with fidelity the public, their employers and clients
3. Striving to increase the competencies and prestige of engineering profession, and
4. Supporting the professional and technical societies of their discipline.

The fundamental canons for the professional engineers are as follows: -

1. Engineers should hold paramount the safety, health and welfare of the public in the performance of their professional duties,
2. Engineers shall perform services only in the areas of their competencies
3. Engineers shall issue public statements only in an objective and truthful manner
4. Engineers shall act in professional matters for each employer or client as faithful agents or trustees and shall avoid conflicts of interest
5. Engineers shall build their professional reputations on the merit of their services and shall not complete unfairly with others
6. Engineers shall act in such manner as to uphold and enhance the honor, integrity and dignity of the profession,
7. Engineers shall continue their professional development throughout their careers and shall provide opportunities for the professional development of those engineers under their supervision.

2.3 Relationship of engineering profession to basic science and technology; relationship to other professions.

Engineering itself is an application of knowledge and skill acquired through a specialized training, education and experiences and practicing the same as an occupation in the areas of public safety, health and property protection. In short it is a systematic application of knowledge and skill.

The basic science teaches us the law of nature, properties of matter and sources of power that are available around us. Technology teaches us the best application of those laws of nature and utilization of the properties of matters and sources of power by which, engineers can make new facilities and create new services. Basically the basic science and technology used in an integrated form as separate profession for the welfare of people is engineering. Therefore, engineering knowledge is not possible without basic science and technology.

Basic science and technology includes physics, chemistry, mathematics and technology includes those in which the process or method of applying those material properties for the use of mankind are described. The technology describes how to become or how to make. Combining both of these subjects forms engineering subject.

As engineering works involve large funds for creating facilities and services for the people. As the projects involve budget and the people, the engineer in charge and the staff need to have good procedure of keeping accounts and rapport with stakeholders. Therefore, engineering profession involves mainly the following professions – accountants, lawyers, medical and managers. Accountants keep records of expenditures, lawyers helps in executing works within legal sphere, medical person helps in keeping people of engineering safe and healthy and managers helps in sorting and executing

works as per state' rules and regulation and maintaining good relationship with other stakeholders without creating conflicts.

Therefore, engineering profession has a deep relationship with law, account, medicine and management profession. Auditing, budgeting, managing conflicts and maintaining harmonies in the work sphere are some of the professions engineering profession have deep relationships.

Chapter 3

Engineering professional practices sectors in Nepal

3.1 Public sectors, Government organizations like ministries, departments, regional and district offices, corporations, institute of engineering etc.

Public sectors in Nepal are understood the organizations that are run by the budget sanctioned by the government. The organizations in which qualified people can compete for participation are public organizations. All the ministries and departments, regional offices, district offices and other sister organizations are the public sectors wherein any qualified Nepalese citizen can apply and be nominated for the job. The ministries enlisted in the budget announcement for fiscal year 2060-61 BS are as follows: -

1. Finance Ministry
2. Industry, commerce and supply ministry
3. Law, justice and parliamentary ministry
4. Agriculture and cooperative ministry
5. Home ministry
6. Population and environment ministry
7. Water resource ministry
8. Physical planning and works ministry
9. Culture, tourism and civil aviation ministry
10. Foreign ministry
11. Land-reform and land management ministry
12. Women, children and social welfare ministry
13. Defense ministry
14. Forests and soil conservation ministry
15. Science and technology ministry
16. Education and sports ministry
17. General administrative ministry
18. Information and communication ministry
19. Local development ministry
20. Health ministry
21. Labor and transport ministry

Other public organizations are as follows: -

22. Secretariat of national planning commission
23. Finance ministry
 - a. Internal loan section
 - b. Foreign loan section
 - c. Investment section
 - d. Miscellaneous section
24. Royal family and palace offices
25. Royal council- constitutional bodies
26. Parliament – constitutional bodies
27. Courts – constitutional bodies
 - a. General administrative
 - b. Commission of investigation for abuse of authority (CIAA)

28. Auditors offices
29. Public commission office
30. Election commission office
31. Office of Attorney General
32. Council of justice
33. Office of Prime Minister
34. Ministerial council
35. Center for national awareness
36. Municipalities
37. DDCs, VDCs, Regional level organizations under various ministries

Corporations and companies are considered semi-governmental organizations, in which government authorities appoint apex positions and others by the Public Service Commission. The following are some of the corporations and companies in Nepal in which engineering graduates can practice engineering professions: -

1. The National Construction Company of Nepal (NCCN)
2. The Nepal telecommunication company (NTC)
3. The Nepal royal airlines corporation (RNAC)
4. Nepal diary development corporation
5. Nepal industrial development corporation (NIDC)
6. Royal Nepal drugs corporation
7. Nepal electricity authority
8. Nepal Rastrya bank
9. Nepal Agriculture bank
10. Nepal Banijya bank
11. Hetauda cement company
12. Nepal Jadi-Buti udyog company
13. Tribhuwan university
14. University Grant Commission
15. Himal Cement Company

3.2 General Job description of engineers working in public sectors

The following job description is for the fresh or newly entering engineers on the Gazetted third class position, abstracted from the office of Rural Infrastructure development Project (RIDP), HMG/Nepal.

1. to perform preliminary and detail survey, design and estimate
2. to execute and assign for execution of project works
3. to conduct various programs for increasing people's capacity.
4. To report writing of –
 - a. Progress report
 - b. Feasibility report
 - c. Final report
 - d. Monitoring and evaluation report etc.
5. To monitor and evaluate ongoing projects
6. To facilitate donor agencies is involved

7. To execute and perform works and jobs assigned by immediate superiors, and
8. To execute other jobs planned specifically for engineers as the nature and case be.

The general job description of gazette second class engineers in public sectors exercised by the Public Service Commission as per published in the public Service Commission Bulletin no. 11 on Ashad 4, 2054 BS is as under-

1. Planning programming and execution of works.
2. Research on technology, cases , various skills for upgrading,
3. Monitoring, and evaluation and supervision of projects,
4. Administrative activities,
5. Financial administrative activities.

3.3 Private sectors: Construction companies, consulting companies, private engineering colleges etc.

In the open market system, there have been thousands of private organizations in operations in various sectors. As engineers are the technical personnel who work for the greater benefits of the public, entrepreneurs have used them in producing larger quantities in economic investments. Therefore, there are private organizations working more efficiently than government sectors under strict supervision and motivations.

There are nearly 30 private colleges affiliated to five universities- governmental and non-governmental. Construction companies and consulting firms are numerous. Construction companies alone are above 14000- including A, B, C, and D classes. The members of A class constructors is 176, B class-352, C class- 1387, and other D class.

There are many computer institutes to teach computer literacy to computer software design and programming. Private organizations have accelerated their business with the largest technologies available in Nepal. E-Businesses have occurred in Kathmandu. All those privates' organizations employ engineers and the engineers have opportunities to practice their engineering profession in there.

3.4 General Job description of engineers working in the private sectors:

The following job description of an engineer in private organization has been taken from the United Builders and company, an A – class Construction Company in Nepal.

1. To coordinate works between stakeholders- clients, consulting and contractors
2. To layout works, to survey and to estimate,
3. To supervise, monitor, and control works,
4. To control quality, to assess and report to concerning authorities,
5. To prepare bills as a quality surveyor,
6. To plan project and report progress,
7. To prepare technical report and prepare claims if any,
8. To conduct necessary training regarding site work and office organizations system to new staffs,
9. To overall manage of construction project etc.

Chapter – 4

Engineering professional practice Nepal

4.1 The engineering council act 2057

4.2 System of provision for private practice and for employee engineers.

4.1 The engineering council act 2057

The engineering Council Act 2057 came into existence under the Engineering Council Ain 2055, section 37. The Ain was initiated for making engineering profession effective and impressive in Nepal. The Ain has the following main objectives to start with-

- a. To make engineering profession more effective
- b. To regulate systematically and scientifically the engineering profession in Nepal and
- c. To register engineers in the Engineering Council according to their qualifications.

With those objectives, the engineering Council was established in 2057 BS. The council categorized the engineers as under according to section 2 of the engineering council Acts.

1. General registered engineers.
2. Professional engineers.
3. Non-Nepalese registered engineers.

According to Annex-1 of the Acts, the minimum academic qualification has been set bachelor degree in any listed engineering fields. Only those who have attained Bachelor degree in any listed field of engineering shall be eligible for applying for registration in the Engineering Council.

Annex-1 of the engineering Council Act 2057, the bachelor degrees obtained from the recognized academic institutions by the council has listed engineering fields as under in relation to Clause-4, Sub-Clause 1 of the engineering Council Act 2057.

Engineering fields	According to notice published on 2058/5/11. Section 51. No. 19 of the Nepal Royal News part-3
1. Civil engineer 2. Electrical 3. Electronics and communication 4. Mechanical 5. Aeronautical 6. Mining 7. Chemical 8. Metallurgical 9. Metrology 10. Meteorology 11. Geography 12. Civil aviation operation and engineering 13. Survey 14. Chemistry 15. Agri-irrigation engineering	16. Textile engineering 17. Computer engineering 18. Environmental engineering 19. Automobile engineering 20. Industrial engineering 21. Radio engineering 22. System engineering 23. Automation engineering 24. Bachelor of urban and physical planning 25. Geo-technical engineering 26. Forestry engineering 27. Agriculture engineering 28. Energy engineering 29. Information technology and telecommunication engineering 30. Earthquake engineering 31. Architect engineering 32. Electrical and electronics engineering 33. Electronics engineering 34. Avionics engineering

The minimum qualification for professional engineer registration is master degree in any engineering field specified by the Council or the minimum qualification degree may be post graduate in any engineering field specified by the council.

The Engineering Council shall have three separate Register Books- one each for registered general engineers, registered professional engineers and registered engineers shall be in Nepali.

The Council shall provide a certificate to an engineer for being registered in the council. The registered engineers have to take 'Oath' in a paper prescribed by the council while providing a certificate of registration.

Section 3 of the Engineering Council Act 2055 states that the education institution, organizations or any academy which intend to offer Bachelor, master or any Postgraduate engineering degree will be first needed recommendation of the council before approval by the government of Nepal.

Section 4 of the engineering council Act 2057 describes a set of professional morals and professional conducts of all registered engineers as under:

- a. Honesty and discipline: All engineers must provide service/professional jobs without making engineering professional moral low,

- b. Loyalty and Morals: All engineering professional practicing engineers must be loyal to their organization, employers or clients.
- c. Impartiality: While practicing engineering professional knowledge and skill, engineers should be impartial in relation to religion, color, gender or caste or any other.
- d. Performing only related professional jobs only: The engineers should practice their knowledge and skill in engineering within the scope of their education, profession, knowledge and skill.
- e. Never do anything that brings low moral in the engineering profession: Engineers should not come financial or other influences by any change while performing engineering jobs that lowers engineering moral in the society.
- f. Personal responsibility: In engineering professions, engineers are responsible for their doings.
- g. Name, Rank and register no. : The engineers must produce their name, rank and registration number after their professional work like writing, drawing, design, specification, estimate, etc.
- h. Do not publish statements to leave unnecessary influence: The engineers shall not publish any notice or writing that brings influence the public and other client unnecessary.

Section 5 of the Act states an examining committee of three members formed under the coordination of a council member shall examine any complaint registered against any engineer in the council.

The examination committee, in its doings, may suspend the engineer under examination so that further mistakes may not be added up. The engineer that has been complained of doing misconduct or immoral conduct shall be given an opportunity to clarify of his/her doings before the examination committee.

The examination committee will produce its recommendation on the case to the executive board of the council for study and making decision whether the engineer should be removed or reinstated in the registration book from suspension.

In the study of the recommendation, is the culprit is found guilty, he/she shall be informed to the organization, client or office of his or her misconduct. The council will seize registration membership and ban from practicing engineering profession for him/her.

4.2 System of provision for private practice and for employee engineers.

The Nepal Engineering Council Ain 2055, Section-3(p.7) states that-

‘No engineer should practice engineering profession without being registered in the council even if graduated from the institute recognized by the council. This will be effective after a year from the implementation of the Nepal Engineering Council Ain 2055.’

From the above statement, the provision for practicing engineering profession in any Nepalese organization is prohibited unless registering in the engineering council. This is simply for regularizing engineering professional practice in Nepalese societies, keeping in view the safety, health and protection of the property of the public.

Any engineer complained against his/her professional practice to the council will make a sincere examination of the conduct of the engineer and if found guilty, s/he will be recommended the same and the engineering council will inform the organization in which the culprit has been practicing engineering profession.

When the council does not permit anyone’s engineering practice without registering in the council, the council has made provision under Section 3 for applying for registration. The following is the process of registration –

1. Apply for registration:

- a. In the prescribed format of the council, a person wishing to apply for his name to be registered should apply.
- b. Those who have been practicing engineering profession before the coming of the engineering council should apply in the prescribed format within six months from the implementation of the engineering council act.
- c. Those wishing to apply according to a or b above need to submit certificates, awards and other papers relating to academic qualifications along with specific registration fees.

2. Checking for the application:

The registrar of the Council will check all the papers submitted along with application and then submit to the subject committee if the council.

3. Checking on the application and recommendation:

- a. The subject committee will make necessary checking on the application submitted by the registrar.
- b. Anything unclear realized by the committee will be made by asking to submit necessary papers and certificates.

- c. Any necessary paper demanded by the committee and to submit the same by the applicant is applicant's responsibility.
- d. If the committee finds qualified for registration after checking according to a, b and c above, the committee will recommend to the council for registration.

4. Register the Name:

The council shall decide to register the name of the applicant in the format of Registration Book prepared by the council, if the council finds the recommended name right for registration in the council.

5. Certify the Registration of the name:

After the decision made for the Registration by the Council, The Registrar will register the name in the registration Book and provide a certificate of Registration of the Name in a specified format.

6. Inform if the decision is made not to register the name:

If the council decides not to register the name of the applicant showing any reason, the registrar will inform the applicant in writing.

7. Removal of the name from the register Book:

1. The name of the engineers from the register Book shall be removed except in the following cases:
2.
 - i. Mentally ill,
 - ii. Bankrupt in case being unable to pay loans back,
 - iii. Violated the specified professional conducts and reported to the council to remove the name from the register book and if decided by two third majority.
 - iv. If the court proved the engineer guilty in public case on moral ground,
 - v. By mistake or mischief if anybody without basic qualification has been registered,
3. The council shall form a committee to make recommendation on the case by examining the engineer that is reported blamed and removal his name from the Register Book.

4.3 Contract law:

‘The law of contract is that branch of the law, which determines the circumstance in which a promise shall be legally binding on the person making it’.

- **Sir William R. Anson**

‘A contract is a agreement enforceable at law made between two or more persons by which rights are acquired by one or more to act or forcible on the part of other or others.’

- **A. K. Sen, Commercial Law**

According to the Contract Act 2023 Nepal, a contract is an agreement between two or more than two parties to do or not to do any business. This indicates that there involves at least two parties, one of which make an offer and the other is an acceptor. Without an offer and acceptance, there cannot be a contract.

An offer is a proposal presented before someone with the hope of getting consent to do or not to do any business. Whereas acceptance is consent given by the person or a party before whom an offer was made. There occurs a contract when both offer and acceptance between them take place. But the following context has to be present making a contract:-

- a. If a person or party accepts an offer to whom it was made, contract exists,
- b. If the acceptance is not given within the stated time with the offer, contract does not occurs,
- c. If there was no time frame for the acceptance of an offer, to be contract, consent has to be given within a reasonable time,
- d. If an offeree has mentioned that in a contract time period if disagreement with that offer is not received, the offeree considers that offer has been acceptance, in this ground, contract does not occur.
- e. In the case of an offeree is dead or becomes insane after making proposal but receiving the acceptance of the sane, the offer becomes void,
- f. If a person/party gives consent or an offer, with a certain changes does not occur contract in this case without acceptance by the proposer.

Essential elements of contract:

To have a contract or to have offer and acceptance between two or more parties to do or not to do some business, the following are essential:

1. Offer and acceptance:

There must be an offer from one or more parties and the same must be accepted by another party to make contract. Offer without acceptance without offer does not make contract.

2. Competent parties:

Parties or person who make contract must be competent according to law. If a party is not capable to accept or offer, there cannot occur a contract. A person below 16 years of age, mad,

senseless is incapable to make contract according to contract Law of Nepal. But if a guardian for such person makes an agreement, there can be a contract.

3. Legal relationship:

Any contract must be made legal relationship between offeree and acceptor. Providing a cup of tea by a friend and accepting it as an offer cannot make a contract for something.

4. Free consent:

Acceptance or offer, both should be free consent from both parties. A forced offer or forced acceptance cannot make a contract.

5. Lawful consideration:

The contracting parties must have an offer and acceptance with a condition. Any work done without any condition and the benefits obtained by other parties cannot be a constant.

6. Lawful propose:

Contract for doing cannot be an illegal matter or purpose.

7. Possibility of performance:

Any contract should be within possibility of performance. The law does not consider legal of the contract⁶ work is not within the possibility of performance.

8. Certainty:

Contractual conditions must both be unclear and unlimited. Both parties under the contract must have understood the term and conditions.

9. Lawful Object:

Illegal, immoral and against the public welfare subjects objects cannot be a contractual matter.

Voidable contract:

As per Contract Act 2023, the following contracts are void able, if any of the party desire to make it void:-

1. Forceful contract,
2. Entered in to contract because of undue influence,
3. Contract involving fraud and or misstatement.

Void Contracts:

As per Contract Act 2023, the following are void contracts:-

a. Contrary to the statutory law:-

If the contracts or its intentions are against the law of the country or contrary to the law, the contract becomes void automatically.

b. Ambiguous, Vague and Unlimited Contracts:-

The contracts must be specified, defined and bounded within certain parameters so that the contract can be executed against certain target.

c. Non-Possibilities of Performance:

When the contract seems of not possible for performance, the contract becomes void.

d. Contrary to public policy and welfare:

Any contract against the public policy and welfare shall automatically void contract.

4.4 Preparation of tenders Document and tendering process:

Tendering is an offer by notice through news media for the knowledge of larger number of qualified or potential and capable parties to do or not to do certain works. It has a fixed time for certain activities notified for bidders. If any potential bidder fails to fulfill those conditions, then the bidder is considered disqualified.

The bidding/tendering is practice to draw attentions of those competitive bidders who have capacities and proven ability to bid for as per set terms of prequalification of the bidders. Both the LCB and ICB are the types of bidding categorized by the International bank for reconstruction and development (IBRD) and International development Association (IDA), which are hereafter called Banks, for the loans/grants under the administration of either or both for the following purposes. Those system of tendering/bidding been adopted in Public Works Document, 2003 as well.

- a. For the need of economy and efficiency in the implementation of the project, including procurement of goods and works involved.
- b. For the bank's interest as a cooperative institutions, in giving all illegible bidders from developed and developing countries as opportunity to compete in providing goods and works financed by Banks.
- c. For the Banks interest as a development institution in encouraging the development of domestic contracting and manufacturing industries in the borrowing countries.
- d. For the importance of transparency in the procurement process.

For bidding works or services, the standard bidding procedures are of the following two types on the size and types of the projects:-

a. Local competitive bidding/National competitive bidding(LCB/NCB),

b. International Competitive Bidding

Local or national; biddings are for providing opportunities for using uprisings potential bidders for building and strengthening capacities to come up for works and services internationally through competitive bases, whereas international bidding are for those parties from any country unrestricted by the United Nations for any political or other reasons.

For both of the biddings, the procedure is similar only difference is the time allocated for biddings looking for more internationally capable bidders. They have to produce contract document in a specified pattern for competition for the project work.

The papers that form complete Document for agreement of the works are contract document. The contract document explains the size, type and quality of the works, its mode of construction, payments, design and drawing, legal bindings, obligations, etc for the smooth execution of the work. Any misunderstanding in the work execution is explained under the basis of contract document. A tender document is prepared under the following sections, which forms a contract document:-

1. Invitations for bidders,
2. Bids distribution,
3. Instruction to Bidders,
 - a. General,
 - b. Bidding document,
 - c. Submission of bids,
 - d. Bid opening and evaluation,
 - e. Award of contract,
 - f. Bidding data,
4. Forms of bid, qualifications, information, letter of acceptance and agreement,
Standard forms:-
 - Contractor's bid,
 - Qualification,
 - Letter of acceptance,
 - Agreement
5. Conditions of contract
 - General,
 - Times control,
 - Quality control,
 - Cost control,
 - Finish the contract,
6. Specifications,

7. Drawings,
8. Bill of qualities,
9. Security forms
 - Bid security,
 - Performance bond,
 - Performance Bank guarantee (conditional)
 - Performance Bank Guarantee(unconditional)
 - Bank Guarantee for Advance Payment

After preparing a tender document complete as state above under various section, the next step is to go for tendering. Tendering process starts with the publications of tender notice in national and international news media. If the target parties are exposed from within the nation, the tender notices must float in the national newspapers for specified time period. In Nepal tendering is done on the following process as per FAR:-

- a. For the works of estimated and approved amount up to NRs 1,000,000.00 (1m), tender notice is floated/published two time in local newspaper,
- b. For words of estimated and approved amount of more than NRs 1m needs to be published in National Newspaper two times at least
- c. The tender notices need to be kept on Notice Board of the tendering office and send to local offices – VDC, municipalities, DDC, and contracting office each,
- d.

While preparing a tender notice, the following information must be incorporated in the notice –

- Time available for buying Tender form (the date of availability for buying)
- Name and addresses of offices from where the tender documents are available.
- The cost of tender document
- Place, date and time for submitting filled up tender
- Bid security amount (earnest money) and form of security
- Other relevant information as the case of the works or services is

However in Kathmandu valley, all the tender notices are published in National Newspapers. In case of International competitive bidding or global bidding. The notices are sending to International Business Papers and to embassies in Nepal.

For the foreign parties, the tender document should be included with the evidence papers as following: -
The party should have a agent appointed in Nepal, and the papers concerning to the agent should be included with the tender document as follows: -

- Name and address of the agent
- The commission that the agent takes or charges
- Types of currency and mode of payment etc any condition set with the agent,
- Income certificates and
- The approval paper of being agent from the party.

4.5 Finalizing the contract document

Contract documents are checked in two stages: -

1. At the time of receiving bids, the essential documents, which comprises contract document, are checked. Especially those documents which may cause problems in accepting the bid bonds, and the numbers of documents that are required to be submitted, such as experience certificates, recent tax paid firms' documents etc.

2. Second scrutinizing is at the start of evaluation. Before going into the evaluation action, a prior check of all contract documents are once checked and if any document is found missing, the bidder is informed by telephone or e-mail to furnish the same as earliest as possible.

After preliminary checking of all submitted tender documents, the office of the organization starts evaluation of the biddings. Generally the bids are evaluated for two capacities – past and present performance experience and present physical capacity for executing the projects successfully and the bid amount. The evaluation is done as per standard qualification format prepared as part of the bid document.

The evaluation table is prepared of all bidders showing different elements of qualification. During evaluation if any information found incomplete, the evaluating team may ask in writing and the bidder will furnish it. The parties obtaining the highest score will be noted and the same shall be compared with the bid amount. The one who has the highest score in capacity and the lowest bidding amount shall be recommended for award of the contract.

Sometimes the highest scoring party in capacity may bid higher. But while recommending a party for award of the contract, the recommending body will give many alternative options of selecting one party and the Board of Directors will decide one for the award of the contract.

4.6 Approval of the contract Agreement

The approval of any contract has been categorized as per capacity of the office organization. Any organization headed by gazette third class officer and other by second-class gazette officer has been differently provided capacity of approving agreement. The following show the maximum limits of approval of the office head as per their class of ranks -

a. Procurement of works:

Description	Amounts in NRs	Approval Authority	FAR Rules No.
Works without cost estimate	Up to 25000/-	Office in-charge (Project manager)	63(10)
Approval of cost estimate	Up to 2.5 m Up to 5m Up to 50 m, More than 50m	Gazette 3 rd class, Office in charge Gazette 2 nd class, Office in charge Gazette 1 st class, Office in charge Department head	63
Approval of tender Evaluation committee recommendation and awards of contract	Up to 10 m Up to 20 m Up to 50 m, More than 50m	Gazette 3 rd class, Office in charge Gazette 2 nd class, Office in charge Gazette 1 st class, Office in charge Department head	73(1) 73(1)b 73(1)(c) 73(1)(d)
Method of procedure	Up to 10,000 m Up to 1 m More than 1m Emergency works no limit stipulated	By direct negotiation, By sealed tender, By bidding, By direct labor or direct negotiation	64(10)(a) 64(1)(c) 64(1)(d)
Construction contractors' classification	Up to 2.5m Up to 3m, Between 2 to 10 m, Between 6 to 30m, More than 30m	Preference to users' committees, Class D may bid for, Class C may bid for, Class B may bid for, Class A may bid for,	Construction Enterprises Act 2055, 10(2) and 10(3) and FAR 2055 Rule 80.
Qualification of contractors	Approval of criteria, method and qualification	Concerned secretary	65(1)

b. Procurement of Goods

Description	Amounts in NRs	Approval Authority	FAR Rules No.
Approval of tender Evaluation committee recommendation and awards of contract	Up to 10 m, Up to 20 m, Up to 50 m, More than 50m	Gazette 3 rd class, Office in charge Gazette 2 nd class, Office in charge Gazette 1 st class, Office in charge Department head	73(1)(a) 73(1)(b) 73(1)(c) 73(1)(d)
Method of procedure	Up to 10,000 m Up to 1 m More than 1m More than 1 m (in special circumstances)	By direct negotiation, By sealed tender, By competitive bidding or public bidding, By negotiation, force account or public bidding	58(1)(a) 58(1)(b) 58(1)(c) 58(1)(d)
Qualification of manufacturers	Approval of criteria	Concerned Secretary	65(1)

Note: - Pre-qualification required only in the purchase of heavy and construction equipment costing more than NRs 10m.

c. Hiring of Consultants

Description	Amounts in NRs	Approval Authority	FAR Rules No.
Short listing of consultants	N/A	Recommendation : Project manager Approval: Department Head	-
Approval of section of Consultant	Up to 300,000 Up to 500,000 Up to 5 m, More than 5m	Gazette 3 rd class, Office in charge Gazette 2 nd class, Office in charge Gazette 1 st class, Office in charge Department head	81 (16) a 81 (16) b 81 (16) c 81 (16) d
Method of Hiring consultants	Up to 100,000 Up to 500,000 More than 500,000	By direct negotiation, By sealed tender, By competitive bidding with technical and financial proposals	81 (2) a 81 (2) b 81 (2) c

Note: - (From PWD: Part 1 Organization Directives Chapter 7 Summary of Authorities in a Project, January 2002)

4.7 Community based engineering project launching procedure

Community based engineering projects are the projects that seek participation of the community for its identification, selection, designing, implementing and maintaining for their direct uses. Consultants are appointed to identify community – based projects with the involvement of the communities. Community based projects involve at least one member and especially headman from each family of the community.

The consultants usually conduct a survey to identify needs of a community. In the context of Nepal, usually donor agencies are involved in financing a particular community based project. Community based projects are social projects, which involve many kinds of people residing in the community as member of the users' group.

Users' group is those group of people who are directly involved in the project from identifying, planning, execution and maintenance of the project. They are trained motivated and made activated in the works of the community so that the facility built may last longer providing/serving as expected.

In engineering works, irrigation and road are the sectors that have community based-projects ongoing in Nepal, although forestry sector has a remarkable success in developing and maintaining community forests.

As earlier mentioned the engineers are the people who study properties of matters and sources of energies and apply the same in the benefits of human beings. The natural resources that any state has, are – a. forest, b. land c. water and d. mines. With this concept the government of Nepal has attempted to explore in forests, land and water for the development of the nation. Also it is realized that the sustainability of the developmental project lies on the shoulders of the involved local people. With this concept the government of Nepal has formulated community forestry; community maintained irrigations and community built roads.

In irrigation projects the design, implementation and maintenance of canals are tertiary level largely involve user's group of people. The needs, types and sizes of canals are tertiary levels are therefore identified, planned, constructed and maintained by them. They are organized in a group, responsibilities are shared and they do daily and periodical maintenance of the tertiary canals. It is considered that the system of irrigation involving users' group from the identifying an irrigation project to maintaining stage of the canal last longer functioning. The people involved in the project consider as their own projects, from which they directly fruit from the projects. So, the people around the using water sectors are motivated and encouraged to actively take role in community projects. The main and branch or even sub branch canals are constructed and maintained and repaired by the development of the ministry.

Similarly is the case for rural/agricultural roads. The trunk roads, highways, district roads are constructed by road department, whereas the roads which link the village or the community of users group with the district roads are simply known as rural roads. The people involved in identification, selection, planning, construction and maintenance are known as users group.

The community based engineering projects are initialized for the reasons that:-

“With the involvement of local people in identifying local needs and resolves problems, the system will last long. They will realize that the facility built as a project will reflect their efforts and at the same time they will know the maintenance and repairs as well. It will reduce the effort of motivating to maintain the structure. Also, the community project will unite the people, work together and build strength of the community. With the increase building of strength of the community, they will tackle other problems solving together, and as the nation is built of many communities, and all the communities become strong and development, there will need no more time to attain required development. The local people will know how to plan, construct and maintain the other community project as well. They will grow togetherness and strength of the community for any development activities thereafter.

The community road construction programs have the following objectives:-

- a. To make facilities of transportation from village to market centers by building village roads,
- b. To develop market centers for the trade of agriculture and livestock products,
- c. To provide support for the institutional development of the local development under the decentralization policy of the government,
- d. To encourage environment protection activities by discouraging the environment ill efforts from the construction.

For this purpose, the rural Infrastructure development Project (RIDP) initiated under the assistance of the Asian Development bank (ADB) has set the following three activities for community road program:-

- a. Rural road construction,
- b. Multipurpose community Building construction and
- c. Awareness increase in people activities.

The identification and selection of the project for the Rural Infrastructure Development project have already been completed before the loan signing agreement between the Asian development bank and the Government of Nepal. The Asian Development Bank has made grants available for the identification and selection of the studies of six rural roads projects in three districts. From this feasibility studies, layout of the road has been selected. According to decentralization concept of the government, the project identification and selection is done with the consultation of the users group at DDC, VDC and local users according to their needs and demands. During feasibility study with the importance of local people's participation, road users' groups have been formed.

4.8 User's group formation and community participation in development activities

Formation of users' communities (Rural Infrastructure development Projects)

The two users' communities shall be formed at local level for rural road construction, operation and maintenance. There will be a district road users committee (DRUC) in each road layout. The

district road users committee will function policy matters on road construction and maintenance and repairs. The committee will form the selected people from among the local users' people, ranging from 11 to 18 including president, deputy president. In addition, one representative from district level industry and commerce association, social organization and transport professional organization shall be in the advising committee. The district road users committee shall be formed from the responsible representative member or headman from each family within the area covered by 1.5 km either from the centerline of the road.

Besides this, each road layout shall be divided in to 7 km to 15 km portion and each portion will have separate users committee and named as local road users' committee. Family head or representative member from the family from within the area covered by 1.5 km rather side from the centerline of the layout shall make the local users' committee of 7 to 11 members including president and deputy president. According to the construction plan, the local road users'; committee shall be formed for each road portion annually.

The main objectives of the road users' committee shall be to be involved in construction and maintenance and repair works of the road, to supervise and monitor the construction and to manage the labor for the work.

The district development committee or district office unit shall will call meeting and ask to resist in forming users committee. The DDC will provide necessary information reporting roles, responsibility in the road construction and maintenance and repair.

Formation of users' committee (Bagmati Irrigation Project)

Users committee in the use of the water for irrigation purpose has been initiated in irrigation projects from Bagmati Irrigation Project (BIP). The recommendation of the feasibility study of the Bagmati irrigation Project states that the BIP should establish Water Users organization (WUO) in Bagmati Command Area Development (BCAD, in parallel with the commencement of the survey and design, since WUO plays an important role in irrigation management and farmers' participation to the project as well As collection of water charge and the farmer' sharing cost of the project investment. Though WUO, WUAs, WUGs, and WUSGs, the farmers' intentions and opinions on the irrigation and drainage system will be discussed and reflect their views to the planning and designing of BCAD during the detailed design state. The WUO should be established before the issue of irrigation water. Once issue of the irrigation of water be made without establishment of WUO, it will be difficult to organize WUO smoothly at the later stage. Therefore, it is strongly recommendation to organized WUO in parallel with the BCAD design works.

Procedure of registration of users' committee:

All the committee formed under the program e.g. DRUC and LRUC shall be registered in the office of the chief district office (CDO) under the Association and Institute Registration Ain 2034. After the formation of the committee of one month, the committee will apply in the office of district administration for registration. The committee shall be recognized legal only after obtaining certificate of registration from the office of district administration.

The district office unit will avoid to the formed users' committee a sample of rule and regulation. The CDO unit will also assist by providing necessary information for registration in the office of CDO. It will also help the members of users' committee anything about the sample rule and regulation.

The consultant will assist the users' group by motivating in registering in the office of the Chief District Office. The consultant will also train the members of users committee to clearly understand the rules and regulations.

The district road users' committee and or local road users' committee will perform all necessary activities in registration the committee in the office of the Chief district office.

There will be an agreement between the users' committee and the DDC for the project undertaken. Both the users' committee will make an agreement separately DDC in the specified format.

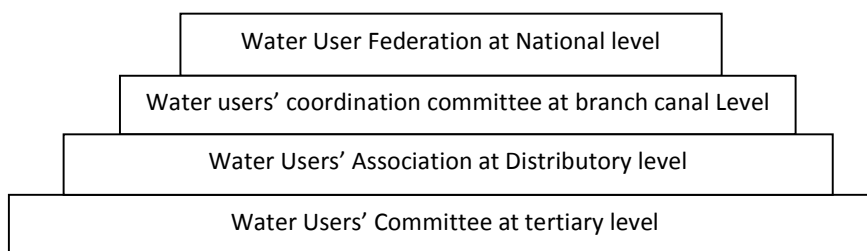
Procedure of registration of users committee in Irrigation Projects:

The command Ares Development (CAD) programs shall be according to the Irrigation Act 2049 (First revision 2053). The tertiary canals shall be constructed with the people's participation. The investment of the construction of tertiary canals shall be in proportion of 75% of the total from the government and 25% from the user. Prior to construction, all the users committee to tertiary canals shall be formed for the active participation in the construction of tertiary canals. For the management and distribution of water, water source management, and canal management purposes, water users committees and farmers' training shall be conducted. In addition to it, users' participation program shall be conducted to increase the income of agriculture farmers of these sectors.

From the lowest tertiary level, the formation of water users' group (WUG) shall be started. The formation of water users' group shall be formed at various levels as under according to Irrigation Act 2056 rule no 3-

1. Tertiary level- water users' sub group,
2. Secondary distribution level- water users', group,
3. Distributory level- water users' association,
4. Branch canal- coordination committees.

The above various levels of water users' committees shall be registered in the relative irrigation office to obtain legacy. The following water users' organization has been proposed for the effective water use by the government on Nepal in irrigation department.



(3) The procedure that the examination committee has to follow in checking the case will be as per specified.

8. Cancellation of the Certificate:

If the council decides the name of the registered engineer from the Register Book, the Register will inform the engineer by removing the name from the Register Book and cancelling the Certified of the engineering.

Re-registration the name:

1. If the name of an engineer is removed the name from the register Book as per decision made by the council and if the engineer wishes to apply registration and s/he can apply in a prescribed format at least after a year showing reasonable causes.
2. If the council decides to re-register the name, it can re-register the name of the applicant again.
3. The Registrar will have to prove a certificate to the applicant in a prescribed format after re-registration the name in the re-registering the name in the Register Book after the decision of the council for re- registration.

Conclusion:

All the engineering professionals have to register in the engineering council for practicing engineering professional, no matter it be in private sector or government or even corporations. There may be some engineering professional working under registered engineers without registering own names.

The government recognition and the legal status of the performance of any engineer will be only when the engineer supply the work with his name, registration number and rank of his/her position in the organization.

4.9 Liability and Negligence

Liability is a troublesome responsibility. It is a legal binding, or an obligation. In engineering engineers while performing their duties may create liabilities because of their doings. Engineers are active actors in the society to raise the life of people by creating facilities and services. When enough attentions towards all likely to be affected parties are not paid, liabilities are likely to occur. Liabilities occur because of negligence in performance. The liabilities that most engineers face are tort liabilities. There is an organization liability, which is understood as vicarious liability.

Tort liability:-

Sometimes while performing engineering duties, engineers happen to harm or damage to other unconcerned, non-related person or property. The engineers perform jobs more attentively towards their clients or organizations, but even doing so, they happen to cause damages or harms to those who are not related to the jobs at all. That happens because of unnecessary incidental negligence in doing jobs. Incidental negligence seeks compensation for the damages. That kind of negligence that harms unrelated person or property and seeks compensation is a tort liability.

Therefore, engineers are likely to come across tort liability cases many times. A “tort” is an injury to another person or to property, which can be compensated under the law. To give rise to a legal claim in tort an act must satisfy four elements as follows:-

1. There must be a legal **duty of care** to another person,
2. There must be **breach of that duty**,
3. The claimant must have **suffered damages**, and
4. The damages must have been **proximately caused by the breach** of the duty.

The gross negligence which really connotes recklessness, disregard for the rights of others, represent the conscious failure to exercise diligence in an effort to prevent an injury, which the situation indicates is very likely to occur in the absence of special precaution.

Contributory negligence is the negligence on the plaintiff's own part, which contributes to injury, or harm of which s/he has complained of and it will bar recovery of the negligence therefore interposing a plea of contributory negligence will avail the defendant nothing even if his/her negligence was of the gross variety.

The standard of care is a concept of a normally prudent man developed by common law over a period of many years, will be applied to the defendant's behavior to see if it conforms to a standard of reasonableness in the light of the apparent risk. The standard of care assumes the following:-

- a. A normal intellectual capacity , memory ability and the like,
- b. Minimum knowledge, skill and experience as is deemed common to nearly everyone,
- c. Considers whatever additional or superior knowledge, skill and experience the particular defendant possesses.
- d. The alleged tort-feaser's own physical trait handicapped etc.

Torts, which are usually intentional:

Torts, which are intentional, are the ones committed knowingly its outcomes. There are many different intentional torts in nature but a few of them are given here:-

1. Fraudulent misinterpretation
2. Defamation,
3. Right of privacy,

4. Malicious Prosecution.

1. Fraudulent misinterpretations:

In this intentional tort, the plaintiff must prove that:

- a. Defendant has made a false material statement of the fact,
- b. The defendant either should have shown a reckless disregard for the truth or know that what he advanced as true was usually false,
- c. The defendant intended to induce reliance by plaintiff,
- d. The plaintiff did with justification rely upon the accuracy of the statement,
- e. The plaintiff was damaged in consequence of such reliance.

2. Defamation:

A statement is defamatory if its nature tendency is to subject the victim to ridicule, contempt, hatred or the like. The court decides whether an odious interpretation could reasonably be drawn from the questioned statement, and the jury's function is to determine whether the statement was actually understood in the harmful way alleged by the complainant. The defamatory meaning of the wording used may be obvious or may arise in the light of the surrounding circumstances, which later the plaintiff would have to show. It must be proved that defendant to some third person communicated the alleged wrongful remarks.

Defamation is traditionally divided into a. slander, b. libel. Slander is oral defamation published without legal excuse, while libel takes the form of written statement, picture, images etc. All true libel is actionable per se; that is the law will infer that third person have read objective remarks and that damages has been done to plaintiff's reputation. In most slander cases, the plaintiff must make a showing of actual damages.

3. Right of privacy:

A person's life history, name, and likeness constitute the physical indicia of his individual existence; those things are in a sense property right and will be protected against unprivileged invasion, particularly when commercial aspects actuate the violator.

4. Malicious Prosecution:

By means of an action for malicious prosecution, a person may receive for harm done to his reputation, behavior etc. as a result of an unsuccessful criminal proceeding against him maliciously and without probable cause.

Vicarious Liability:

Vicarious Liability means that employers such as hospital are responsible for the acts of their employees if the acts are within the scope of employment. An employer is responsible for the acts of his/her employee as long as the employee's acts within the persons' job description.

The rationale for vicarious liability is that the employees' actions are part of the hospital's business. Thus in effect are the hospital's actions: any action by the employee is done at the employer's instruction, and the employer is in a better financial position to pay legal damages.

However, employees are also responsible for their acts. Professional regulatory bodies may take away the abilities to practice. Health care workers may be sued in civil cases. As well, the state may lay criminal charges against a worker in cases of gross negligence resulting in serious harm.

4.10 Business and labor law

All the activities that the people do can be classified into two:-

- a. Economic affairs and
- b. Non-economic affairs.

The affairs that are service oriented and non-profit are considered non-economic affairs, whereas the affairs that aim at earning profits are economic affairs. Therefore, business profession and daily wages are all economic affairs.

In general, business means earning profit from doing. "Business may be defined as human activity directed toward producing or acquiring wealth through buying and selling."

-L.H. Henry

- a. Economic objectives, (business needs to run not only for earning profit, but also to survive in the competitive market. So, business seeks or innovates new ideas or tactics of business.)
- b. Social objectives, (Business needs people to run it. Business has to address society and their needs so that business flourishes.)
- c. Human objectives, (all business runs through people, and if people are unattended, it may be collapsed. Training, seminar, education, motivation are some of the business.)
- d. Organic objective and (Business needs to save its existence or needs to grow and expand to avail services)
- e. National objectives (Business needs to serve national interest so that if the nation prospers, the business automatically flourishes.)

Business grows along the development of human beings. In the beginning, business was simply sole concern or one man run business. A single person faces unlimited liabilities, difficulties in individual management and control, with limited operation, individual risk etc initiated partnership business, in which risks and liabilities are shared.

In partnership business, there involves two or more than two partners with mutual agreement. They share profits, risks and management and control. But the partnership business felt absence of separate entity, and restriction in the transfer of interest.

To overcome the limits of the partnership business, a joint stock company business occurred. It is an artificial person, has separate entity in the eyes of the law, has limited liabilities, capital is divided into shares, transferability of share, members at least 7 and representative management system has been introduced.

Public enterprises mean state ownership and operation of industrial, agricultural, financial and commercial undertakings. In such enterprise, engineers can only use as their engineering professional practice fields. They are financially autonomous and legally distinct entities or partly owned by government.

Cooperative organizations are the one that collects capital from many people and run the business. When the capital is weak, many people involve in raising funds to run the business. It has been a very successful business in developing countries in various sectors.

The government of Nepal has implemented Company Ain 2021, through which people can start business. It has the following characteristics:-

7. (1) According to this Ain, the established company will be a non-ending successor organization, and the company will have a separate seal for doing business.

7.(2) The company shall acts as an individual to buying tangible and intangible property, mortgage or give as a gift, and if anybody or any company wish to writ against any member of the company, it can be done so through the company's name.

7. (a) According to this Ain, the company shall not open partnership or private firms.

47. Member as far as possible be present in the general body meeting:

All the members as far as possible shall be present in every general body meeting. If the agenda of the meeting is concerned to finance or by any reason if an auditor ha to be present in the meeting, at least an auditor's presence is necessary.

48. Legacy of the Meeting:

All the shareholders present in the meeting shall confirm that the call of the General Body Meeting is legal or not, prior to the start of the meeting and in that case even if the call of the meeting is not legal and if the presence of members satisfies the minimum members as per article 51 for agreeing the meeting the calling of GB meeting shall be considered as of legal.

49. Conditions prohibit participation and voting in the meeting:

1. A member or his/her representative shall be prohibited from participating and voting in the meeting if the issue is conditional restriction between him/her and the company. But s/he shall be provided an opportunity only clarify issues concerning him/her in the meeting.
2. Anybody who is a member of executive body, managing agent or shareholder or representative shall not be participate in the discussion of his/her appointment in the company, release from the post, transfer or not to, proving or deducting bonus or any agreement that has his/her selfishness, contract or procurement of contract.

66. Inability to be appointed or having any executive position

1. The following person cannot be member of an executive body:-
 - a. Less than 21 years of age,
 - b. Mentally ill or mad,
 - c. Bankrupted,
 - d. Involve in any theft or fraudulent, misuse of wealth under his/her responsibility and the court has proved for punishment,
 - e. Showing any selfishness in any contract or agreement of the company.
2. In the following condition, any person will not remain in the executive position:-
 - a. In case not qualified according to Clause 1 above,
 - b. Being absent without informing executive committee for continuous three times,
 - c. Without obeying continuously to concerned department or executive committee,
 - d. Passing by two third majority of the general body meeting to remove from the executive committee,
 - e. Accepting the resignation forwarded by him/her,
 - f. Proved by the court as disobeying in the activities of the company or selfish motto.
 - g. Any activity that compel to withdraw from the executive committee by this Ain.

69. Duties and responsibilities of the executive committee

- (1) The committee shall manage company's all activities; execute rights and duties under the Rules of the Ain and the decisions passed by the GB meetings from time to time.
- (2) The executive committee will appoint necessary personal for executing the company's activities, but in the case of public company, if any executive member's close relative has to be appointed in the company, the appointment must be approved by the General Body's meeting and accepted by the concerned department,
- (3) None of the members of the executive committee shall not do any activity that is beneficial to him/her without any decision and acceptance of the General Body's meeting and the concerned department respectively,

70. Executive Committee's meeting

- (2) Executive members shall be present in the meeting of executive committee. Any representative of any executive member shall not be valid.

72. Responsibilities of the executive members:

Any executive member of the company knowingly or unknowingly or carelessly does harmful acts or orders others to do harmful acts, such harm or loss shall be fulfilled from every member's properties in equal proportion. If any part from any member's property can be fulfilled, such remaining shall be fulfilled from other member's property in equal proportion. And if all harms cannot be fulfilled, the same shall be continued till all harms are fulfilled from all members.

But any member who has disagreed for doing such acts in writing or those who did not know that the acts are going to be harm shall not need to bear the fulfillments.

Labor law:

Labor Act 2048 of HMG/N states that employees must be selected and appointed under section 3.4 of the Act as under:-

1. Required to advertise vacant positions and apply selection procedure,
2. Appointment letter with terms and conditions of employment- to be notify labor office,
3. The process applies to the contract workers and piece rate contracts,
4. Non-Nepalese are not allowed to employ- but they may engage with special permission from the labor department,
5. Nepalese workers are to be trained and non-Nepali workers need to be replaced gradually,

Labor or employees are recruited and appointed in the following procedures:

Acquisition:

Hiring of the labor force required for any organization. It follows the following procedure:-

1. Children are not allowed to work as per article 5.1 of the labor Law.
2. Labors are not allowed to transfer to the similar job in the company.
3. Ownership change of the company does not affect the employees' service and service condition according to Article 8.
4. Protection of service: Employees/workers cannot be terminated without fulfillment the procedure stated in the labor act or regulation Article 10.
5. Temporary Layoff is permitted with half salary according to article 11.
6. Forced retirement at the age of 55 years is it can be extended for another 5 years, if the company needs to do.

Condition of work (Section 3, Article 16-20)

1. Working hours per day is 8 hours or 48 hours of week according to the article 16.
2. The starting time of any work shall be decided by the management of the company according to article 17.
3. The law has provision for rest and Tiffin time for all labors after every 5 hours of continuous work and then half an hour break for Tiffin and rest according to article 18.
4. The law also provision for over time and has to paid 1,5 times more wage but the overtime is not a compulsion.
5. The law states that company requires to keep attendance record according to article 20.

Compensation (Wage- Section 4, Article 21-26)

1. Minimum wage, dearness allowance benefits to be set by a minimum wage setting committee(employee, HMG, management representative in equal number)(21)- minimum wage information to be published in the gazette
2. Provision for annual increment- half a day wage
3. Payment of salary wage in time- management's responsibility (Article 22 -23)
4. No pay cut except in the following conditions(24)

Conditions for pay cut (Article 24)

1. Imposed fine, pay cut for being absent
2. To cover the loss of the firm due to the negligence of the employee
3. For the benefit being provided
4. Excess payment
5. Medical benefit coverage during suspension
6.]pay cut from the order of the court, govt. office
7. Tax deduction

Health and security provisions Section 5

1. Clean working environment (article 27 ka)
2. Enough air and light at the work place, proper waste disposal system, protection from air and noise pollution, adequate working space (15 cum working space), safe drinking water, modern toilet facility at convenient place for both male and female employees, fire exit and extinguishes, smoke free environment, health check up each year.

Health and security provisions

1. Eye protection- use of protection devices (28)
2. Protection from chemicals(29)
3. Protection from fire (30)
4. Protection from dangerous machine (31)
5. Lifting weight – specified maximum weight (32)
6. Protection arrangement for workers who work in pressure plants.
7. Labor depart can order firms to apply safely measures

Employee welfare

1. Provision for employee welfare fund (37) section 6
2. Compensation for injury or loss of body part
3. Gratuity, provident fund, medical expenses(39)
4. Leave – public holidays, study leave, home leave, maternity leave, mourning leave, special leave
5. Housing arrangement (5% of the annual profit to be used for gradual development of housing facility)
6. Childcare provision (if more than 50 women employees)
7. Rest rooms and canteens (if more than 50 employees are working)

Disciplining (section 8)

1. Types of punishment:
Warning, stopping annual increase, expulsion
2. Bad manners (Acharan) physical attacks, terrors, destroying property, theft, misuse of resources, more than 30 days absence without notice, bribes (Article 51)
3. Clarification after having proof or evidence
4. Labor department can dismiss the employees
5. Managers or proprietors to be punished (55)
6. Employees may appeal to the court within 35 days

Resolving labor disputes

1. Provision for labour court (72)
2. Personal claim or complain
 - To management, if not resolved
 - To labour office to be resolved within 15 days, if not then by labour offices chief within 7 days
 - If the decision is not acceptable, employee may file the case to the labor court.

Process for collective bargaining

1. Claim or demand to be signed by 51% of the employees/workers and to be submitted to the management, (article 74)
2. Negotiation between the representatives of two parties – agreement within 21 days

3. If not resolved negotiation in the presence of labor office
4. If not resolved negotiation (individual or committee) to be appointed and conflicts to be resolved within 15 days.
5. If the decision of the negotiation is not acceptable, parties may appeal to the HMGN within 35 days
6. If decision is not made within 60 days, workers may go on strike following the procedure stated in clause 76

Process to go on strike

1. Required to inform before going on strike (76) with demand (proposal) approved by 60% of the employees. Written information 30 in advance to the management, labor office, local administrator
2. If the above procedure is not followed, the management may close the operation by receiving the permission from the government.
3. If the laws have restricted employees of some enterprises of public importance, employees cannot go on strike.

Collective bargaining

1. The outcome of the collective bargaining agreed and signed by the both parties, should be considered as law for the concerned parties
2. The signed contract shall be effective from the date of registration in the office or from the specified date.
3. Concerned parties may report the labor office if the signed agreement is not followed – labor office may implement the collective agreement following due process.
4. HMG can order to stop strikes in unusual circumstances

4.11 Personnel and Financial regulation, Tippani system

The difference in the performances among the organization is because of the personnel employed and maintained in there, others – such as equipment, plants and materials required for various levels of work are the same as specified for the work. This indicates to load more emphasis on the people employed in the organization. But how to acquire the most appropriate personnel for the jobs identified is the problem.

In Nepal, the jobs that have to be done is described in a job description, although most of the offices and post do not have job description as such. This is so happened because the acquiring people in an organization used to be through relatives alone. The employed person used to learn all tricks and trade of the job later and accordingly used to be promoted. Recruiting and selecting was not a systematic and scientific.

Now, the government of Nepal, especially where in public concern are involved, the labor law does not allow randomly to hire people for any post and jobs. A kind of consensus from superiors needs to be collective and justified in a document, which is known as 'Tippani' in Nepal.

The administrative assistant is generally asked to raise a file as a tippani file for a work to start in a near future. s/he makes a background for raising tippani for the position for creation on the

basis of rules and regulations under which the organization is functioning. The administrative assistant sends the tippani to the head of the organization. The head seeks official and legal suggestions and advice from his/her official experts and subordinates as well, generally in relation to finance, expertise and specific purpose. The tippani sometimes dealt as informative agent to other officials seeking their views.

In tippani, the section head that needs people to work under him makes a list of the jobs that the new appointee has to do. At the same time, s/he makes requirements in the applicant with a background of the work, need of skill and knowledge or qualification to do the job, number of people, age, experience, gender, place of work, level of the post etc. the section makes a brief note and submits to his/her immediate superior asking to recommend the same for further action and place his/her signature and date at the bottom of the notes.

Sometimes, the section head as s/he requires working people under him/her, will raise an issue of needs through a letter to the head of the organization. If the head finds it necessary, he will ask his/her administrative assistant to raise a tippani file for the same to be fulfilled.

Tippani file is a confidential file in which written advice and suggestions from different necessary officials have put their views. It should not be given to unauthorized people by any chance and at the same time the registering books must note whereabouts the file on different dates.

Very important tippani files are red tapped in India and ordinary files are green tapped. But in Nepal, all ordinary tippani files are stippled and important files are not differentiate from the ordinary files except the handling over personally to whom it has to be sent.

Starting just below the signature, the person who is going to give suggestions, starts writing comments justifying necessary or not necessary and submits the file. To whom the tippani need to be processed.

While raising tippani, major aspects that influence the legacy of the tippani are rules and regulation, needs and financial. Therefore, the section heads, wherein the positions are necessary raises the needs through application, letter and or through other means after which the administrative assistant under the direction of the chief raises tippani as per rules and regulation. The tippani is then sent to financial head for his/her advice on financial matter.

Acquisition of manpower in any organization is supported with the needs and duties of the types of manpower required. In Nepal, the needs and types of manpower is initiated through Tippani, a kind of notes on the issue concerned expressed by various levels of responsible positions. The system of hiring or acquiring manpower is basically as per Human Resource Acquisition described in the previous lesson, but recording and maintaining inventory of the staffs (human resource) need to be initiated in offices.

4.12 Norms adopted for the construction of building, highways, irrigation etc

Norms are the standards prepared for rate analysis by HMG of Nepal. It gives task of each individual manpower and machine per hour or per day. Also it gives materials required per unit of work. Recent and local rates of manpower, materials and machines wherever in the country of Nepal, are obtained. The rates of materials and manpower or machines are obtained at the

place of their uses. Thus this includes transportation, handling, storage and loading and unloading etc. the amount thus obtained is added with 15% of it as profit and overhead charges. The total thus obtained is added up with VAT by 10% to get the rate of unit assumed.

The government of Nepal strictly follows the norms so that the quantity of materials and manpower or machine by any chance will not differ from the standard. It is done so because there are always chances of playing various quantities of materials, manpower or machine and earns more money by illegal ways.

The CIAA or arbitration seeks the basis of rate analysis and the legal basis is the norms. Anybody adopting other ways of establishing rates can be sued and or be rejected if it is in the beginning. Engineers adopt the norms in all ministries without any doubt. The engineers' consultants, contractors all need to use the norms to eliminate corruptions by increasing quantities for making additional money.

4.13 Duties, responsibilities, authorities and power delegation system

An engineer is one whose occupation entails the utilization of expertise in the formation of design, detailed plans and specification of a facility or services or supply for use by contractors, and supervisors. In supervisory capacity, the engineer is supposed to guard against substandard workmanship and prevent materials deviated from plans and specifications.

The following professional services by an engineer shall expertise as his/her duties and responsibilities and obligation –

1. Participating in necessary conferences and preliminary studies.
2. Preparing design, drawing and specifications,
3. Assisting in drafting of forms of proposal and contracts,
4. Preparing cost estimates,
5. Obtaining bids from contractors/suppliers,
6. Letting contracts with the owners' written approval,
7. Inspecting the contractors' works on regular basis, including checking of shop drawings,
8. Interpreting for the contractors the meaning of the drawing and specification,
9. Ordering the correction/removal of all works and materials not strict conformity with the specification,
10. Keeping accurate books and records/documents,
11. Issuing certificate of payments,
12. Determination of substantial completion,
13. Time extension.

Engineers' duty to owner/employer:-

1. Fraudulent issuance of a payment certificate will subject the wrongdoer to liability for all resulting damages,
2. An engineer renders him/herself liable to his/her employer where s/he breaches duties to exercise the requisites care and expertise-
 - a. Preparing defective plans (on advice for poor design and plans, code of practice, city building ordinances etc),

- b. Delaying construction by tardy completion plans,
- c. Significantly under estimating costs or
- d. Specifying inferior materials.

Liability to third party

Liability to outsiders lawfully on the premises for injuries the 'proximate cause' of which is the defendant's negligence in preparing defective plans or otherwise malfunctioning in connection with the erection of an unsound structure constituting a hazard to the public at large or some segment thereof, or

Architect's failure to exercise the ordinary skill of his profession expose him/her to damages claims brought by the third person- perhaps employees of the contractor, business visitors to the property or passersby – where there is a direct causal connection between the negligence performance of duty, be it planning or be it supervisory in nature, and the forcible harm suffered by plaintiff.

Engineers' power delegation is not an easy and trustee job. The field of engineers' liability has been explained above. Other authorities such as administrative or managerial, delegations are normal as in administration. The head may delegate his/her power to his/her able subordinate in written to clear the daily works. But the subordinate that has been delegated the authorities must be capable and expertise in the sector of being power delegated. The person who has been power delegated should not involve in financial and legal matters. s/he shall only be power delegated for the continuation of daily works for not exceeding a fortnight.

Whenever power delegation on his/her absence for not exceeding a fortnight should be in written paper and c/c to finance and store offices for their information. The person being power delegation must continue daily routine works but whenever financial or other crucial works come across, s/he shall keep pending till the real authority holding person comes to the office.

4.14 Relationship to foreign firms works in Nepal

The foreign firms working in Nepal are usually as in the form of consultation. They came here in Nepal for their specific specialties. The foreign firms have come to identify projects. In the beginning, Nepal had not enough technical manpower with required level of expertise. Therefore, foreign firms have come to Nepal in many sectors.

In the start foreign democracy American experts have come to Nepal to advice in formulating Nepalese education system. American experts have set Nepal's educational objectives in the beginning Dr. Hugh B. Wood (1956 AD), writes in "Education in Nepal" that he was invited to discuss educational problems and possibilities by the officials of Education Ministry of His Majesty's Government of Nepal in 1953 A.D. He was asked to study the then present educational situation and recommend a project for the development of national education system in Nepal. He decided to work at top level as an advisor to the Nepal national Education Commission.

Similarly the government of Nepal has approached the government of Federal Republic of Germany to assist in the utilization of the country's water resource potentials for hydropower

generations, irrigation development and water supply. The following projects have been listed by HMG/N for further investigation:

- i. Bagmati and Kamala High dam Multipurpose Projects
- ii. Marsyandi Hydroelectric Project
- iii. Koshi River Development Study

The Federal Ministry of Economic Cooperation (BMZ) as an concerned Ministry of the government of the FRG has entrusted the German Agency for technical Cooperation Ltd. (GTZ) to delegate a mission for projects identification to Nepal consisting of 4 to 5 highly qualified experts as –

- iv. Hydraulic/water resource engineer
- v. Engineering geologist
- vi. Energy-resource-management specialist
- vii. Additional specialist if required

From June 19 to 30 Mr. H.D. Doescher, Hydraulic Engineer visited Kathmandu for preparatory mission and during the first week of August 1977, the German Mission for water resource development in Nepal arrived in Kathmandu.

The department of Meteorology and Hydrology of the ministry of food, agriculture and irrigation will be mainly involved during the preparatory phase of these projects.

The mission frequently visited the three departments to collect data and information. The electricity department (ED), and irrigation department (ID) were cooperating with the mission in providing local transport and housing during the field trips and members of their site inspection. (The Federal Republic of Germany (GTZ) Final report Nov. 1977.p.III).

Therefore, the relationship to foreign firms to Nepal depends upon the mission they have been in Nepal. The firms, visited Nepal on the request of the government, receive governmental attentions as the German Mission got. The government of Nepal has to look after their visits to site, transport, stay, and information collection. They need to be escorted at all activities for providing necessary information and at the same time safeguarding national interest information as well.

Coordination with other agencies (From PWD)

Coordination with other agencies and projects stakeholders is prerequisite for the success of a project. It is necessary to secure teamwork and cooperation by preventing conflicts among the agencies. Conflicts arise because of ignorance of other agencies. There may be of two types of coordination –

1. Internal within the projects office, and
2. External coordination

But the focus is on external agencies coordination. During project preparation and implementation stages the cooperation of several line agencies working at the project level is needed. The following are some of the external offices that a project needs to cooperate –

- a. Other sector agencies,
- b. District administrative office,
- c. District treasury controller,
- d. Local bodies
- e. Coordination committees

1. Other sector agencies

There are various other sectors that the project needs to cooperate during its implementation. Some of the important other sector offices are –

- a. District forest office, and
- b. District land and revenue office

District forest office:

The forests are protected by the forest Act 2049 and Forest regulation 2051. The district forest office is responsible to –

- Ensure clearance of forest areas on time required for projects,
- Ensure the conservation of the forest, wildlife and natural management
- Ensure availability of natural endowments such as stone, gravel, lime and timber required from the forest areas,
- Ensure availability of the land for the resettlement of persons displaced by the projects
- Ensure availability of seed, seedlings and plants for the right way of the project and in some specific environmentally sensitive areas,
- Ensure access through forest areas for the transportation of goods, commodities and other requirements for the project.

District Land and Revenue Office:

The role of the land and Revenue Office and District Administration Office on land acquisition aspects is regulated by the land Acquisition act 2034 and corresponding regulations. They have responsibilities to –

- Ensure cooperation for land acquisition, compensation, land registration, land measurement and mapping.
- Ensure revenue settlement and resolution of landlessness and squatting problems caused by the project
- Locate government fallow land for resettlement of persons displaced by the projects.

2. District Administrative Office (DAO)

There are several activities where the project needs the help of the district Administrative Office as follows: -

- Maintenance of law and order in the project areas,
- Clearance of villagers or any establishments which may hinder the project's activities or prevent access to the project site,
- Protection of the local population from potentially hazardous project activities
- Protection of blasting materials required for project, its transportation to the project site, and its use,
- Obtaining the cooperation of the police and other security agencies needed for project activities
- Property acquisition for the project or leasing of areas for the contractor's worksite or haul routes,
- Ensuring easy availability of goods such as petroleum products and other commodities needed for the projects,
- Fixation of wage rates of laborers, skilled and semiskilled workers and house rent through rates fixation committees.

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3. District Treasury Comptroller Office

The District Treasury Comptroller Office has a vital role in project financing administration. The project cannot disburse amounts in time without its coordination. Coordination with DTCO has the following objectives –

- Ensures trimester release of budget as appropriated,
- Ensure release of the budget quickly from MOF or the concerned departments,
- Ensure the deposit of the unspent amount in the consolidated fund at the close of the fiscal year,
- Conducts an internal audit of the accounts of appropriation, revenue and deposits of the project office,
- Deposits the balance of amounts received that exceed the limit fixed by FCGO.
- Maintains and clears the record of audit discrepancies indicated by auditors,
- Repayment of deposits to the depositors
- Training to the accountants working in project office,
- Release imprested amount receiving the project budget to run daily office operation and makes reimbursement expenditure of the month,
- Resolve problems concerning financial administration in the office

4. Local Bodies

A project can only be successful if it responds to the people's needs and interest and involves them actively in the project identification through implementation. People's interests are reflected by their representatives in local bodies such as VDCs /DDCs and municipalities. The cooperation of such local bodies in the following areas is essential –

- Collect information for the identification of the projects
- Obtain DDC approval for the identification of the projects
- Access to the database of the district Development Information Center established by DDC,

- Mobilize people needed for project implementation
- Obtain accurate information on the implementation of the project and identify the reason for any resistance from the people,
- Measure the change resulting from activities or inputs of the project in a particular area,
- Ensure cooperation of the people to obtain land, site clearance and other logistics such as houses or shelter required for the projects
- Obtain natural endowments such as lime, sand, gravel and timber needed for the project and its easy transport to project site,
- Obtain cooperation for the safety of project employees, contractors and the tools and machines to be used,
- Obtain cooperation from the availability of food stuffs required for project employees and workers working in the area,
- Mobilize users' committees, supervision of their work and get work done through them,
- Ensure registration of the competent 'D' class contractors, users' committees or community based organization.
- Ensure the taking over the completed project by local bodies, users' committees of community based organization and its operation and maintenance by them through user charges or other fees.

The activities of local bodies are governed by Local Self-Governance Act 2055, Local Self-Governance Regulation 2056 and Local Body Finance Administration Regulation 2056.

Coordinate committees

The project has to ensure cooperation and coordination from different agencies for Committee' comprising the institutional head of different agencies who are related to project works is constituted as an inbuilt system for the project. This will facilitate the project work as well as will ensure the corporation and coordinate for the project. Normally DDC chairman should chair such coordination committee and the CDO should be vice chairman and the project in-charge should be secretary cum member of the committee. One coordinate committee is sufficient in the district. Simply the secretary should be the concerned project I-charge who needs to have such co ordination mechanism.

Principal Agencies where Project Coordination is Required

Government Agencies	Responsibilities
1. National Planning Commission	<ul style="list-style-type: none"> • Formulation of national policies, • Preparation of 5 years plan
2. Ministry Of Physical Planning And Works	<ul style="list-style-type: none"> • National roads and bridges • Water supply and sanitation, • Urban development
3. Ministry Of Land Reform And Management	<ul style="list-style-type: none"> • Land acquisition, compensation, • Land registration, • Land measurement and mapping, • Resolution of landlessness and squatting
4. Ministry Of Home Affairs	<ul style="list-style-type: none"> • Conflicts resolution and social security
5. Ministry Of Law, Justice And Parliamentary	<ul style="list-style-type: none"> • Legal consultation and conflict resolution

Affairs	
6. Ministry Of Population And Environment	<ul style="list-style-type: none"> • Environment policy • Pollution control • Migration policy • Review of NGO and INGO activities regarding any development activity
7. Ministry Of Women, Children And Social Welfare	<ul style="list-style-type: none"> • Social welfare activities related to women children, disabled and other vulnerable groups
8. Ministry Of Finance	<ul style="list-style-type: none"> • Budget approval • Financial administration
9. Ministry Of Water Resource	<ul style="list-style-type: none"> • Hydropower policy • Irrigation management • Flood control and river training
10. Ministry Of Forest And Soil Conservation	<ul style="list-style-type: none"> • Watershed management • Forest and wildlife conservation • Natural environment conservation • National parks and royal herbariums
11. Ministry Of Culture, Tourism And Civil Aviation	<ul style="list-style-type: none"> • Conservation of cultural heritage • Archeological studies • Protection and conservation of various ethnic groups' culture and literature • Management of transport and airports
12. Ministry Of Labor And Transport Management	<ul style="list-style-type: none"> • Information on labor force and markets • Policy on employment and trade unions • Social security
13. Ministry Of Local Development	<ul style="list-style-type: none"> • Rural and remote area development • Local water supply, sewerage and sanitation • Local roads including agriculture roads, mule tracks and suspension bridge
14. Ministry Of Industries, Commerce And Supplies	<ul style="list-style-type: none"> • Geological and mining information
15. Ministry Of Science And Technology	<ul style="list-style-type: none"> • Metrology

Note: the responsibility of the ministries shown above are subject to change by HMG/N in which case the new responsibilities will be applicable accordingly.

Legal issues

Intellectual property was not always recognized as a single field of law. Historically, the fields of patent, and trademark developed independently. In the late 20th century, however, legal experts began to recognize that these various fields of law have a great deal in common because they all pertain to intangible products of the mind. Nevertheless, an attorney will often specialize in only one area of intellectual property, such as patent law, and the legal rules for the different branches of intellectual property law vary greatly.

In all branches of intellectual property, the legal system seeks to balance two competing concerns. On the one hand, protection must be strong enough to encourage authors and inventors to invest the necessary effort in innovation. On the other hand, the law must also allow people some freedom to use the intellectual property of others. This is because artistic, technological and commercial progress always requires building on the work of others. To strike the balance all branches of intellectual property law confer general rights on creators but also limit those rights with a variety of exceptions. For examples, in patent law, a scientist may use someone else invention to conduct experiments. Similarly, copyright law allows a literary critic to quote passages of a novel in a review. Under trademark law, a company may use a competitor's brand name in a comparative advertisement. In all these ways, intellectual property law tries to be flexible enough to protect the property rights of the creator while also allowing the public to benefit from the protected work.

In the US and other countries, intellectual property has gained increased protection with advances in technology and international trade. However, some countries tolerate the widespread sale of counterfeit versions of intellectual property products, such as software, movies on videotape, brand name athletic goods, and even patented medicines. Violations of intellectual property rights costs the owners of the rights billions of dollars each year. These costs stem from lost royalties and sales in the markets dominated by counterfeit products. In an attempt to reverse this situation, most nations of the world signed the Agreement on Trade Related Aspects of intellectual Property Rights (TRIPS) in 1994. Administered by the World Trade Organization (WTO), TRIPS strengthened legal protection for intellectual property around the world. The US has also attempted to negotiate direct agreements with countries such as China, where counterfeiting has been particularly extensive.

Computer based communication presents exceptional challenges for intellectual property law. For example intangible work such as text, music, and pictures can be copied more easily and cheaper than ever when it is posted on the internet. US government has conducted studies to decide what changes might be necessary to protect new forms of intellectual property, but it has not yet decided which changes to adopt into law.

HISTORY OF INTELLECTUAL PROPERTY LAW

Some forms of intellectual property, such as trademarks, date to ancient times. But comprehensive legal protection for intellectual property did not become common until the 18th century. The American colonies had laws granting patents long before the outbreak of the American Revolution in 1775. Soon after the revolution, all but one of the 13 original colonies adopted copyright laws.

When the Constitution of the United States was ratified in 1789, it granted the US Congress the authority to “promote the progress of science and useful arts, by securing for limited times, to authors and inventors, the exclusive right to their respective writings and discoveries.” Under this power, Congress adopted both patent and copyright laws in 1790, one of its first acts. Congress has amended the intellectual property statutes frequently since then in response to changes in technology and economics. There are committees in both houses of Congress that have the responsibility of keeping intellectual property laws up to date.

International protection of intellectual property rights was first addressed in treaties beginning in the late 19th century. For example, the Berne Convention of 1886 protected artistic and literary works among member countries. Since then, many international treaties have addressed intellectual property rights. The World Intellectual Property Organization (WIPO), based in Geneva, Switzerland, administers some of these treaties.

Contributed by:

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Trademark

INTRODUCTION

Trademark, any word or symbol used by manufacturers or sellers to identify their goods and distinguish them from the goods of others. Trademarks help consumers to identify goods they have used and enjoyed in the past. Trademarks also allow consumers to avoid goods and services that dislike. Examples of well-known trademarks include Coca-Cola for soft drinks, Kodak for film, Nike for footwear, and Microsoft for software.

Most countries of the world legally protect trademarks. Trademark law is one branch of the larger legal field known as intellectual property, which also includes copyright and patent law. Because consumers often continue to buy products they trust, well-known trademarks can be extremely valuable. For example, experts in trademark law estimate that the value of the Coca-Cola trademark is more than \$30 billion.

HISTORY

Throughout history, makers of goods have put their names or other marks on things they produced. Items such as medieval swords and ancient Chinese pottery were marked with

identifiable symbols so buyers could trace their origin and determine their quality. Before the 20th century, trademarks were usually symbols or pictures rather than words, since many people in the world could not read. Formal legal disputes over trademarks arose as far back as the early 17th century in England.

As trade increased in the 19th century, many countries adopted laws recognizing the legal rights of trademark owners. These laws prohibited other sellers from using similar marks that might confuse the public about the source of a product. Congress passed the federal trademark law in the United States in 1870, and has made revisions in the law since then. The current US trademark statute, the Lanham Act, was enacted in 1946. The first international agreement dealing with trademark law was a treaty known as the Paris Convention. Adopted in 1883, it required members to recognize the trademark rights of foreign producers. Most nations of the world are members of the Paris Convention. In 1994, most countries signed another significant treaty dealing with international trademark law. This agreement, called the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS), strengthened legal protections for trademarks around the world.

U.S. TRADEMARK LAW

American companies can have trademark rights under both state and federal law. Under state law, the first firm to use a particular mark is the legal owner of that mark. A trademark owner can gain valuable additional rights by registering his trademark under the federal Lanham Act. To be eligible for federal registration the mark must be used in interstate or foreign commerce. It also must not fall into certain forbidden categories listed in the Lanham Act. For example, it is forbidden to use the flag of a foreign country or the name of a living person without that person's permission. Additionally, inaccurate geographic terms can't be used as trademarks, such as Idaho for potatoes grown in Maine. Most importantly, the general name for a type of product can't be a trademark. Every maker of that product must be free to use that word. For example, Sony is a well-known trademark for televisions and radios, but no one can have trademark rights to the words *television* or *radio*.

The Lanham Act is administered by the US Patent and Trademark Office (PTO), a division of the Department of Commerce. The PTO will not grant registration for a trademark until it has actually been used to identify a product. A firm may, however, begin the registration process before use by declaring that it has a good faith intent to use the mark in the future. In contrast, many other countries will register a mark before actual use, although they often require use within several years after registration. The PTO will also deny registration of a trademark if the mark is similar to one that someone else has previously registered or used in the United States.

After conducting its own examination of proposed trademarks, the PTO publishes these trademarks in a magazine called the *Official Gazette*. This permits members of the public to object if they think the trademark should not be registered. Only federally registered trademarks may use the registered trademark symbol, ®. Trademark registration lasts for ten years but may be renewed indefinitely if the mark is still used.

The owner of a trademark may permit others to use it by granting them a license. Many franchise businesses, such as gas stations and fast food restaurants, involve trademark licensing. The

owner of the trademark must supervise the licenses to make sure they provide a consistent type and quality of goods or services. Failure to supervise can result in loss of rights to the trademark.

Sometimes the public stops thinking of a trademark as a brand name and begins to think of it merely as a general category of goods. The trademark owner has a responsibility to make sure this doesn't happen. If the trademark owner fails in this task, it will lose its legal rights to the word or symbol because the source of the goods can no longer be easily identified. Courts in trademark law declare that such a mark has become "generic". Examples of words that used to be trademarks but are now generic include escalator, aspirin, cellophane, and thermos. Companies that own popular trademarks like Xerox, Kleenex, and Band-Aid spend a great deal of money to make sure the public understands that these are brand names and not generic words.

This law prohibits the use of a trademark belonging to someone else in a way that might confuse the public. Anyone who does this is considered an infringer. The owner of the mark may sue the infringer and is entitled to an injunction forbidding the infringer from continuing to use the mark. In certain cases, the trademark owner may also be entitled to an award of monetary damages. Even if the marks are not identical, or even if they are used on different types of products, a court can still declare this an infringement if it finds that the public might be confused. Courts look at many different kinds of evidence to decide if the public might be confused. Relevant factors include consumer familiarity with the plaintiff's trademark and the intent of the defendant. If a trademark is considered famous, the owner of that mark may prevent others from using it, even if the public would not be confused. This is-----
. For example, in 1963 courts in Illinois determined that the mark *Polaroid* for refrigeration equipment diluted the trademark *Polaroid* for cameras.

Trademark

Trademark means 'a mark that is used by a person for the purpose of distinguishing works or services, manufactured, sold, leased, hired or performed by him from those manufactured, sold, leased, hired or performed by others.'

A trademark may be registered according to the Trademark Act in connection with works and services. The registration of a trade mark gives the owner the exclusive right in use the trademark.

An essential feature of a valid trademark is its distinctness. The trademark distinguishes goods of one manufacturer from other manufacturers so that it must not deceive public.

Patent rights

The Patent Act defines Patent as an invention of "any new and useful art, process, machine, manufacture or composition of matter, or any new and useful improvement in any art, process, machine, manufacture or composition of matter".

The invention must be novel and useful. An idea alone is not patentable; the idea or principle must be reduced to something physical. Therefore, the patentable inventions must have two characteristics- Utility and Novelty- that result from the application of ingenuity and skill.

Discovery alone that an apparatus, for example, may be altered to produce a new result, will not qualify for a patent; one must show that ingenuity (originality in design) has been applied to the discovery to produce a novel and useful method or result.

A patent may not be obtained where an application to patent the same invention has already been filed or the invention has been public use or discussed to the public.

Term of Patent

- A term of a patent is 20 years from the date of application for the patent.
- The value of a patent is enhanced by virtue of the fact that patent rights can be assigned to others, provided that the assignments is in writing.
- Assignment can be in parts / full or whole or in parts and for such valuable consideration as may be negotiated with the assignees.
- Patent rights may also be licensed, on an exclusive or a nonexclusive basis. Usually royalty fee is charged based on a percentage of sales of the patented product.
- Any assignment of a patent right or grant of exclusive licensing rights must be registered in the patent office, otherwise it will be void and therefore, unenforceable against a subsequent assignee or exclusive license who does register.

Infringement of patent

Infringement of patent entitles the owner of the patent to claim for all damages sustained and any damages sustained by owner's licenses by any reason of the infringement. To recover damages, a court action may be brought.

Assignment of patent rights by employee engineer.

Generally it is the inventor who is entitled to apply for a patent. An engineer may be requested, by his / her employer to execute an agreement that assigns to the employer some or all patent rights to which the engineer might otherwise become entitled.

Copyright

Copyright means the sole right to produce or reproduce the work, or any substantial part thereof in any materials whatsoever. Copyright does not protect designs applied to useful articles that are mass-produced. The Copyright Act Nepal, 2022 governs copyrights in Nepal.

Terms of copyrights

Except otherwise expressly provided by the Act, copyright subsists for a term that equals the life of the author and a period of fifty years after the author's death.

Registration of copyright

The copyright act provides that an author, the author's legal representative or an agent for the registration of a copyright at copyright office.

Registration is not essential to copyright however, registration of copyright in a work may assist the owners in obtaining damages may infringement.

The owner of the copyright is entitled to assign the copyright in whole or in part. The assignment must be in writing for making effective.

Issues

1. According to 'Nepal SamacharPatra, 2061/03/17, the following issue has risen up- [In Madya Marsyandi hydroelectricity project, the local people have publicity been complaining about not employing in the project by the contractor as per contract made. Three years before the project was initiated. According to contract with the local people, the contractors have to employ local people (sons of the land) in the project in various positions. According to the president of 'Madya Marsyandi coordination and cooperation committee'', the contractors have not employed even 20% of the total workers. The contractors were informed about the employment contract but no response has been received till today. On the other hand, the administrative officer states that the employments have been made according to the contract made.]

Express your comment on the issue.

2. An issue from The Kantipur Daily, 2061/03/24

[Information is the most valuable property today. All able people want information to receive in time. Presently, in Dailekh in Nepal, the Telephone exchange office started distributing 500-capacity 'E-10 B' cordless telephoning system. The CDO office circulated a notice of prohibition in the use of such cordless telephoning system in the district. Whereas, in other districts, such systems have been in use without restriction for long. According to notice, government offices, INGO and NGO offices collected their cordless sets in the office of the CDO. The area has been suffered from Maoist insurgency for the last few years.

Discuss the issue on the fundamental rights basis.

Issues

1. A subcontractor dismantled the fixed shuttering and centering work from a building site and takes away the materials because of not paid his dues for the last six months, from which main contractor suffers delays in the project finish. The client as per contract charges delay fee at the rate of Rs. 500 per day.
The main contractor requests the client for consideration on the delay fee with an application that the payment was not maid because of delay payment from the client.
The client does not know why the bills have not submitted so far. The main contractor says that the bills have been submitted two months ago to the consultant. The consultant says that some of the works are substandard and also the responsible person for the work has been absent for the last 15 days because of illness.
Find the kind of guilty and explain why she/he is guilty for it?

2. A housing company built a housing complex in low land area and sells all the apartments. For the last 2 years, the rain was not heavy and the tenants had no problems. But last year the monsoon rain was so heavy that the ground floor was half filled with water for 2 days. Since the site was identified as low by the government and the land was restricted for housing purposes, but later the municipality permits constructions for housing with certain improvement for draining out rainwater but the system did not work and the tenants suffered.

Explain the case in relation to obligation.

3. A road project was completed and handed over in the last month. Though there was still 6 months' liability period, but there occur an accident because of the heap of debris at the roadside. The victim sued the road department for their negligence in clearing for the damages occurred.

Discuss the situation, identify the liability and find the exact wrongdoer.

4. A man in desert is dying of thirsty. When you see him, he asks for cold water that is with you in your bag. If you do not give water, the man is really dying of thirsty and if you give water it is sure that he will die to cold water stroke. You describe your situation and decision making whether to give water or not to give water.
5. ABC Company gets a contract of building work in Kathmandu municipality after dismantling old building. A person requests for the order from the court for stopping the construction work, as the old building was offered to the municipality only to run offices till the building exists. Once the building is dismantled, it must be his land as per his claims.

Now, from the engineering point of view, what do you suggest and clarify mistakes whereupon.

Case:

An engineering hired by a software company, believes that the company's new software design is safe under existing standards. However the new software may not meet the new standards that he knows about to be released- standards that performing more tests could cost both the company and the public significantly. Issues of conflicting obligations to the company and the general public also arise.

A software company has hired an engineer, who knows about a standard that is released soon in near future. The company has been developing software, which is compatible with the existing standard but that is not going to work long because of release of new standard. The new standard requires more tests and the test cost more. It is known that the new standard costs both the company and the public significantly.

Step 1

Determine the facts in the situation.

Stakeholder are:-

- Software company,
- An engineer hired by the software company,
- Standard institution.

Step 2

Define the Stakeholders

The hired engineer wants to update the software to meet the new standards. The public needs cheaper, software to use. The company has to undergo many tests on the software, which costs a lot. The consequences are the company required more investment and the public has to pay more.

Step 3

Assess the motivations of \stakeholders

If the company does not test the software for the new standards, the software will help low standards and the sale will be loess. Fewer sales will not be able to collect enough revenue. Therefore tests for new standards must be made and get recognized as competent software. The cost that has been invested on testing shall be proportionally distributed at a rate of small portion per number multiple of software.

The other option in not to test at all. This will not raise the standard of the software in this competent age. The sale shall be deemed low with existing standard.

Step 4

Formulation alternative solution

The sale of new software with new standards is like a hot cake i.e. immediate sale. The people pay for the new standardized software, rather than paying existing one. Therefore, it is appropriate to test the software with new standards, whatever the cost will be. People are usually reluctant to pay more for new products.

Step 5

Seek additional assistance, as appropriate

Therefore, select the process of testing for new standard, so that the software may be able to claim new standardized and serve the people with additional standards of performance.

Step 6

Select the best course of action

I would prefer to conduct testing the software for the new standard, to meet and to serve the people with new standard.

Step 7

Implement the selected solution.