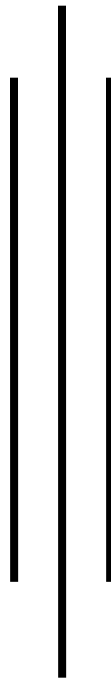


**Introduction to Non-Government Organization
(NGOs) and Brief Highlights on Rural /
Renewable Energy Technologies (RETs)
(With Specific References to Nepal)**



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CHAPTER –ONE:

1.

GENERAL INFORMATION:

1.1History:

The term Non-Governmental Organization is used in variety of ways all over the world and depending on the content in which its is used, can refer to many different types of organization.

The phrase Non-Government Organization came into the use with the establishment of the United Nation Organization in 1945 with the provisions in Article 71 of chapter 10 of the UN charter for a consultative role for organization that are neither government nor member states. As world becomes advance, many problem couldn't be solved within a nation, NGO have developed to emphasize humanitarian issues, development aid and sustainable development.

1.2 Evolutionary Stages of Development of NGOs:

Three stages or generation of NGO revolution have been identified by Kurten's (1990) "Three Generation of the Voluntary Development Action". First, the typical development NGO focuses on relief and welfare, and delivers relief services directly to beneficiaries. NGOs in the second generation are oriented towards small-scale, self-reliant local development. At these evolutionary stages, NGOs builds the capacities of local communities to meet their needs through 'self reliant local action'. The third generation of the NGO is 'sustainable systems development', in this type NGOs try to advance changes in policies and institutions at a local, national and international level, they move away from their operational services providing role towards a catalytic role.

1.3 Types of Non-Government Organization:

Nongovernmental organization is heterogeneous group and various terms have been developed on the basis of their design and their implementation of development related project. They are as follows:

- INGO stands for international NGO
- BINGO is short for business-oriented international NGO
- RINGO is an abbreviation of religious international NGO or stands for Research and

Independent Non Government organization

- ENGO, short for Environmental NGO
- GONGO are government-operated NGOs, which may have been set up by government to look like NGOs in order to qualify for outside aid or promote the interest of the government in question.
- QUANGOs are quasi-autonomous non governmental organization such as the International Organization for standardization (ISO), which is actually not purely an NGO, since its membership is by nation, and each nation is represented by what the ISO Council determines to be the "most broadly representative" standardization body of the nation.

There are also numerous classifications of NGOs. The primary purpose of an operational NGO is the design and implementation of development –related projects. One categorization that is frequently used is the division into “relief-oriented’ or development –oriented organization; they can also be classified according to whether they stress service delivery or participation; whether they are religious and secular and whether they are more public or private oriented. Operational NGOs can be community based, national and international. So basically these organizations typically try to raise awareness, acceptance and knowledge by lobbying, presswork and activities events.

1.4 Definition of NGO as per the Definition of World Bank:

The World Bank defines NGO as ‘Private organization that pursues activities to relieve suffering, promote the interests of the poor, protect the environment, provides basic social services, or undertakes community development’. The terms NGO can be applied to any non-profit organization, which is independent from government.

NGOs are typically value-based organization, which depends, in whole or part, on charitable donations and voluntary services. Although the NGO sector has become increasingly professionalized over the last two decades, principles of altruism and voluntarism remain key defining characteristics.

1.4 NGO Strengths and Weaknesses (on the basis of World Bank):

The nature and quality of individual NGOs varies greatly, it is extremely difficult to make generalization about the sector as a whole. Some of the specific strengths generally associated with the NGO are as follows:

- Strong grassroots links
- Field based development expertise
- Ability to innovate and adapt
- Process oriented approach to development
- Participatory methodologies and tools
- Long term commitment and emphasizes on sustainability
- Cost effectiveness

The most community identified weakness of the sector includes:

- Limited financial and management expertise
- Limited institution capacity
- Low levels of self-sustainability
- Isolation/lack of inter organization communication and coordination
- Small-scale intervention
- Lack of understanding of the broader social or economic context.

CHAPTER-TWO

1. STRUCTURE AND OPERATIONAL MODULE:

The structure and framework of an organization is different on the basis of the objectives of the organization. However most of the organizations have similar organization module.

1.1 Executive Board:

The Executive Board is mandatory in formulation policies, plans and implementing the decisions taken in the AGM. Executive Board is directly accountable to the general members. In general the Executive Board is comprised of the following functions.

- President
- Vice President
- Secretary general
- Secretary
- Treasurer and
- Other executive board members

1.2 Office Bearers' Committee:

The office bearer's committee includes the President, Vice-presidents(s), Secretary General, Secretary and Treasurer.

This committee is entrusted by and accountable to the Executive Board for translating and implementing the strategies and policies into action, managing the daily affairs of the organization through delegation and supervision of the jobs in the secretariat. Normally, the daily meeting of the entire executive member may not be possible.

1.3 Annual General Meeting (AGM):

AGM is the vital part of any organization. One of the main functions of AGM is to elect the President along with other office bearers and executive members. The General Assembly meeting will take place once in a year. In exceptional case, Management Committee will call the meeting in case 50% or more of the members demand for it in written form. More than 50% members must be present for a General Assembly meeting. Notification of the Annual General Assembly must be provided at least one month in advance to each member in written form. During AGM preference will be given for consensus during the decision. If not, decision made by majority will be validated.

Election for the president along with other Executive Committee members, discussion on the policies to be implemented, presentation and discussion on the annual progress report and collect suggestion, ratify the budget prepared by the executive committee and provides suggestion if any are some of the activities performed under Annual General Meeting.

1.3.1 Functions, Duties, Responsibilities and Right of General Assembly:

- a. Chairman of the Management Committee will Chair the General Assembly. In case of his/her absence, the Management Committee will select a member among them to Chair the meeting.
- b. General Assembly can perform the following functions apart from other functions.
 - Elect the Management Committee members for 3 years term
 - Approve the audit report or its ratification presented by Management Committee
 - Approve income—expenditure report presented by Management Committee
 - Appointment of External Auditor
 - Exercise other responsibilities as stated in the statute
 - Amending the statute as per the requirements

1.3.2 Formation Process of Management Committee:

- a. Management Committee must have at least 7 members and can be expanded to 11 members if necessary. Chairperson will be appointed from among the members of the Management Committee. In case, if the Executive Director is not from the member of the Management Committee, he/she will act as a Secretary of the Management Committee.

b. Composition of the Management Committee will be as follows:

Chairperson – 1

Member- Secretary – 1

Treasurer – 1

Members – 4

Total – 7

The term of the Management Committee will be for 3 year

Management Committee's membership will be terminated under following specified conditions.

- In case of resignation
- If a non confidence motion is approved by General Assembly
- In case of continued absence of 3 times in Management Committee's meeting without prior notice and reasonable justification
- If removed from the organization's membership

1.3.3 Meeting of Management Committee:

- a. There will be at least one meeting in every three month.
- b. More than 50 percent members must be present for the validity of the meeting.
- c. Preference will be given for Consensus to come to a decision in the meeting. If not, decision of majority will be validated.

1.3.4 Functions, Duties, Responsibilities and Right of Management Committee

Management Committee holds the right of policy formulation and providing directions for the organization. Except for the other arrangements made in the statute, Management Committee will make necessary arrangement as per the duties, responsibilities and objectives of the organization.

- a. Management Committee holds the right of acquires movable-unmovable assets, sale of the assets and transactions.
- b. Implement or authorize to undertake activities in line with the objective of the organization.
- c. Implement the policies, guidance and decisions made by General Assembly
- d. Nominate the Election Commissioner
- e. Transfer its rights and authority to the Executive Director or other responsible officer to manage and supervise day-to day function of the organization.
- f. Undertake activities as assigned by this statute and rules made

CHAPTER - THREE

1. Types of Renewable Energy Technologies (RETs) Promoted by NGOs:

Rural communities in Nepal have always depended on renewable energies, mostly in their natural forms. With the growing aspirations of mountain and rural communities and rapidly increasing population, energy requirement have been increased to level at which present use of energy resources must be ecologically sound and balances. The application of related rural and appropriate technologies including Renewable Energy Technologies for poverty reduction has been given major thrust in the 10th Development Plan of Nepal (2002-2007) and recently announced Rural Energy Policy of 2006 which greatly emphasizes on the reduction of the tremendous pressure on forest resources, increase the productivity and marched towards the sustainable energy path. Following are brief highlights of some of the main technologies promoted and disseminated by NGOs in Nepal:

1.1 Micro Hydro:

The basic principle of hydropower is that if water can be piped from an upper level to a lower level, then the resulting water pressure is converted to work. If the water pressure is allowed to move a mechanical component then that movement involves the conversion of the potential energy of the water into mechanical energy. Hydro turbines convert water

pressure into mechanical shaft power, which can be coupled to drive an electricity generator, a grinding mill or some other useful device.

1.1 Components of Micro Hydro:

The various components of a micro hydro installation are as follows:

- **Civil Components:** Structures designed to conduct water from source to the turbine for optimum energy generation. It has several sub-components described below.

Turbines:

- The turbine converts energy from the falling water into rotating shaft power.
- **Drive System:** Transmits power from the turbine shaft to the generator shaft or the shaft powering other devices. It also has the function of changing the rotational speed from the one shaft to another when the turbine speed differs from the required speed of the alternator or device.
- **Electrical Systems:** Convert mechanical power into electric power. This consists of a generator and alternator.

1.2 Operational Procedure:

The amount of water and its falling upon the turbine determines the performance of the turbines. The flow through the penstock on to the runner, wherein the shaft attached to the runner starts to rotate. This shaft in turn drives either the mechanical utilities that are attached to it or drives the generator shaft, which in turn produces electricity.

2. Improved Water Mill (Ghatta):

The improved water mill technology is a modified version of the traditional water mills designed on the principals of Impulse Turbine. Table below provides a comparison between the two.

Comparison between traditional and improved Ghatta:

Traditional Ghatta	Improved Ghatta
Wooden runners	Metallic runners
The wooden blades need replacement every year or two, as the flowing water wears them out	Metal runners, are designed to optimise the efficiency of the runner as well as to gain maximum power from the available hydro- power

2.1 Components of Improved Water Mill:

The various components of an improved water mill are as follows:

<i>Phali</i>	Metallic structure placed in the groove at the lower surface of the upper grinding stone and the key of the shaft. It helps transmit mechanical power in the system
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Shaft	It is placed on the Chakati (Base Plate) with Takkar (Pivot) as a bearing and also holds the runner. It transmits mechanical power from the runner to the upper grinder through the Phali.
Runner	It consists of Fourteen numbers of buckets joined with runner hub by arc welding and to give it a circular shape with the help of runner strip and guide ring. It is attached with the shaft by nut-bolts. It converts the kinetic energy of waterfall into mechanical energy.
Takkar (Pivot)	It is placed in the lower hole of the shaft and the Chakati (Base Plate). The Takkar and Chakati jointly work as a bearing for shaft. The water works as a coolant for the Takkar and Chakati.
Chakati (Base Plate)	It is a base plate for the Takkar and shaft. It is joined to the wooden column at the <i>ground surface with a screw.</i>
Hopper	The hopper is normally made of wood or tin and used for feeding the agro products into the grinding stones for processing.
Penstock	Penstocks convey water from the source from a required height on to the runner to rotate it and produce mechanical energy. The penstock can be made of wood or plastic pipes.

2.2 Operating Procedure:

- Fill the hopper with grinding materials.
Allow water to enter the penstock pipe, which is tilted at 30⁰ with the horizontal
- In case of additional end use connect it to the shaft coupled a pulley using flat belts

The water hits the runner blades and the shaft coupled with the runner begins to rotate. When the runner rotates, the upper grinding stone also rotates at the same speed. The feed to the grinding stone should be controlled from the hopper itself.

3. Improved Cook Stove (ICS Domestic):

The Improved Cook Stoves are modified version of the traditional cook stoves, designed to overcome problems that are inherent with the traditional stoves. ICS is made of local materials. The villagers themselves can easily construct it. Improved cook stoves are made of 3 parts mud/earth, 2 parts straw/husk and 1 part animal dung. The whole structure is plastered smooth with the same mud mortar. The iron plates are fitted on the potholes for pots. ICS technology has developed to the optimum level in that its design and installation are popular with users. It can be made in different sizes and capacities to suit the family size and pot size. It can have one or more openings for pots/pans.

It is cheap and easy to operate. There is no need to blow the fire regularly. Similarly, these stoves have been further modified, Institutional Improved Cook stoves, for use in the hospitals, hostels, barracks, teashops and restaurants. All traditional institutional cook stove can be turned into IICS as they are made of the local and cheap materials and it can

be easily installed by masons or trained village males/females. These have been designed to save firewood and improve the sanitation and health conditions at work places.

3.1 Components of the Technology:

The various components of the ICS are:

- The fuel inlet for feeding the fuel (fire- hole)
- Pot Holders, according to the number potholders the ICS is named as single pot, double pot or triple pot ICS. The potholes are round funnel in shape; the pot bottom fits tight on them.
- Inbuilt baffle which allows the flame towards the second pot without losing heat
- Chimney, exit for smoke
- An opening to remove the soot so as to keep the chimney channel clear for smoke to exit easily

3.2 Operating Procedure:

Fuel wood is burnt beneath the first opening. The fire and heat travel from the first opening to the second, with the help of an in-built baffle located just below the second opening. This heats up the pots on them. The hot air and smoke produced inside the ICS exits out through the chimney.

4. Briquetting:

Biomass briquetting is the densification of loose biomass materials (agricultural and forest residue) to produce compact solid composites of different sizes with the application of pressure. The technique of briquetting of residues takes place with the application of pressure, heat and binding agent on the loose material to produce briquettes. Briquettes can be a renewable source of energy (depending on the origin of the waste) and have a high thermal value (16-18 MJ/kg). Converting biomass residues into densities form make them easy to handle, transport and store, uniform in size and quality, increases the net calorific value per unit volume and the process helps alleviate disposal problems related with residues as well as in reducing use of fuel-wood and deforestation.

4.1 Components of Briquetting:

The main components of the selected briquetting technologies are:

Beehive Technology	Extruder Technology
Charring Drum for charring the raw materials	Motor to drive the main shaft of the briquetting machine.
Grinder to crush the charred material into small particles (Compacting machine)	Briquetting System consisting of main shaft, V-belt, pulley, bearing, shaft housing, hopper, screw and die. It compresses the loose biomass into densified form.

5 kg hand weight to help compact the mixer of charred material and clay	Screw to help extrude the briquettes through the heated die with pressure.
Mould to tap the mixture into the mould.	Die Heater to provide necessary heat for compressing the biomass prior to extrusion. It can be of two types,
	Hopper to feed and regulate the raw material in the system
	Smoke Remover kept at the mouth of the die to remove the smoke through a chimney.

4.2 Operational Procedure:

Beehive Technology	Extruder Technology
Dry the raw Material	Dry the raw Material, grind material if they are large particles before use (appropriate size ~ rice husk)
The biomass is charred in the charring drum	Heat the die-heater to require temperature
The charred material is then ground to fine particles	Feed the raw material into the hopper
A mixture of clay and powdered material (40:60) is placed in the mould	Allow the screw to compress the raw material
The mixture is densified applying pressure	Cool the briquettes
Dry the Briquettes before use	

5. Solar Drier:

Solar drying is a process in which the sun heat is controlled to produce heat for drying product so that such product does not easily get spoiled or damaged and can be stored for a long time thereafter. There are different solar drying systems:

1. Traditional solar drying
2. Direct solar dryers
3. Indirect solar dryers
4. Forced Convection System
5. Hybrid (mixed) solar dryers

5.1 Components of the Technology:

Components of the technology are:

- Solar energy absorber glazing
- The dryer box
- Container/tray for products to be dried
- Air inlet

- Air outlet
- Feeding window

5.2 Operating Procedure:

Drying properly requires mastering three fundamental parameters:

- a. The added thermal energy that heats the product and sets the water migrating towards its surface and turning into water vapor.
- b. The capacity of the surrounding air to absorb the water vapor given off by the product. This depends on the percentage of moisture already present in the air before it enters.

6. Solar Cooker:

The solar parabolic cooker has a reflecting surface in the form of a parabolic dish, which concentrates the solar rays at a point at which the black cooking pot is placed. Its diameter ranges from 1.2 to 2 meters. It consists of upper and lower layer reflector sheets made from highly reflective aluminum sheets. These aluminum sheets are fixed to a parabolic shaped metal frame. The reflector is mounted in such a way that focal points of sun ray falls at the pot stand. The total weight of the solar parabolic cooker is approximately about 20 kg. At the bottom of the metal frame four roller wheels are fitted which makes it easy to move around. The net power of the solar cooker is about 700 watt in. In good sunshine a high temperatures i.e. more than 300° is achieved in this cooker and the quantity of heat transmitted to the cooker is proportionate to the reflector area. About 2 liters of water is boiled in about 15 minutes in a sunny day when the atmospheric temperature is about 24°C. Almost every type of cooking such as boiling, frying and even baking can be done in this cooker. Due to this deeply curved parabolic reflector, the focal point lies inside the dish, this does not allow accidents such as catching fire or injuring one's eyes. However care should be taken in handling the solar parabolic cooker.

6.1 The Solar Parabolic Cooker consists of the following components:

- A reflecting surface in the form of a parabolic dish, which concentrates the solar rays at a point at which the black cooking pot is placed. Its diameter ranges from 1.2 to 2 meters.
- Adjustable frame for the reflector surface
- A metal frame with four roller wheels which makes it easily mobile
- A Pot Holder

6.2 Operating Procedure:

- Find a sunny place for your solar cooker.
- Ensure the ground is level when operating your solar cooker.
- Protect the cooker from strong wind.

- Do not cook with an ill-fitting pot.
- To hold pots of different sizes construct a sturdy support of steel and wire. (no rope)
- Swing the reflector dish out of direct sun – step up from behind and you can safely and comfortably handle the pot.
- Re align the sun only every 15 - 20 minutes using the shadow of the pin on the white plate, and hold it in position by the cord. The cooker is correctly positioned when the shadow of the pin has completely disappeared.

CHAPTER- FOUR

1. Role of Rural Technology in Community Development:

More than half of the world's population lives in rural area, 90% of them (some 2.8billion) in the developing country. Vast majority of the people is dependent on the woods, dung and crop residue, often using inefficient technology. These inefficient technologies and appliances mean that wood fuel resources are wasted and high indoor smoke severely impairs health. Taking into mind, new rural technology are being adopted in remote areas in order to reduce to possible health impacts. The benefits of energy efficiency improvements and the use of new and renewable natural resources are as follows.

a) Reduces local air pollution:

Use of new and improved technologies has improved the lifestyle of people as well as the local environment. With the decrease in the amount of forest products, there is a corresponding reduction in the amount of local pollution produced.

b) Offsets greenhouse gases:

Adoption of the rural technology greatly influenced to maintain the greenhouse gas level in the atmosphere. Tremendous pressure on forest will decrease, which ultimately helps to balance carbon dioxide sink in the atmosphere. Renewable energy always helps in contributing to establish the sustainable society, which is the major goal of adopting any rural technology.

c) Increase effectiveness of health program:

Use of rural technology increases the quality of health care. Besides, promotion and dissemination of the rural technology in the remote areas, different NGO, GO and INGO are formulating health related campaign in the remote areas. They have also incorporated micro project along with other program in rural areas to enhance the health status of rural people.

d) Reduce use of synthesis fertilizers:

There are several ways to reduce expenditure on energy and to tap new resources such as development of fuel wood efficient stoves, biomass digester, solar stoves, and fuel wood forestry. All this measures could save large amounts of biomass from being burnt. This unused biomass can be used to produce valuable organic fertilizers to be returned to arable land after the production of the biogas or animal product.

e) Compensation of the rural energy:

Nepal has large variety of biological resources, though the use of all those resources is far from completely and comprehensively utilized. Our economic potential is limited and wastage is considerable. If people could make full use of them, their potential outcomes are tremendous. The supply of the commercial energy to rural and township agro industry is likely to be limited for rather a long time; this increases the importance of developing rural renewable energy resources such as solar energy, wind energy, wind energy, biomass energy, tidal energy, geothermal energy, etc. to higher level as the best situation to this energy shortage.

f) Other socio-economic, environmental and resources benefits:

Using renewal energy has lots of an advantages, it helps to make the sustainable society in a long run. Using renewable energy has lots of positive impacts building the prosperous society. By adopting this technology, people may get surplus time in a long run and they can utilize for other income generating purposes. They are time effective, efficient as well as sustainable. Such technologies definitely help to reduce health hazards, as many of rural people are susceptible from such respiratory hazards. No doubt, this is environmentally friendly too.

REFERENCES:

- 1) Women and Technology Manual, July 2004, Central for Rural Technology Nepal (CRT/N).
- 2) How to manage association more effectively? A reference manual for water mill business membership organization, April 2006, SNV
- 3) Working with NGO, 1996, Anil Chitrakar
- 4) Nepal Yan Sangra, khanda 3(ka), 2055
- 5) Samaj kalyan yan, 2049, samaj kalyan parisad
- 6) <http://www.undp.org/energy/docs/UNDPEFSD-December04.pdf>
- 7) http://en.wikipedia.org/wiki/Non-governmental_organization
- 8) http://www.worldenergy.org/wec-geis/publications/reports/rural/energy_use_in_rural_areas/energy_use_in_rural_areas.asp
- 9) <http://www.unu.edu/unupress/unupbooks/uu17ee/uu17ee0k.htm>
- 10) <http://www.unu.edu/unupress/unupbooks/uu17ee/uu17ee0k.htm>