

# Market situation of Bio-Briquette in Kathmandu, Nepal

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## Abstract

*This paper analyzes the present market scenario of the bio-briquette in the Kathmandu valley. The bio-briquette has been emerged as alternative biomass energy in the Nepal from one decade. But it does not scale up as per targets due to the lack of the awareness, technologies transfer and markets. There are opportunities to establish and replace fossil fuel through using wastage vegetations as well as economic empowerment of local people. It has found that the market situation of the bio-briquette is initial stage. Now, the supply and demand condition is increased trends and it is available in super market, department store and other outlets in the Kathmandu valley. It uses especially in the cooking, heating for children/older, house and office purposes. It is high potential to establish as alternative biomass energy in Nepal through promoting the sustainable markets.*

**Key Words:** Bio-briquette, Alternative biomass energy, Fossil fuel, Sustainable market, Market analysis

## Introduction

Nepal is one of the highest traditional biomass fuel consuming countries in Asia because of its high dependency on traditional biomass fuels, mostly firewood. Historically, the people of Nepal have been able to comfortably rely on the abundant supply of forest wood to meet their energy demands due to its availability, practicality and affordability. Presently, however, the situation is changing as population increases, energy demand rises and the forested areas decline (Asian Development Bank, 2006). In 2002/2003, the residential sector used 90.6% of the total energy consumed in Nepal and the largest fuel source was traditional fuels (forest, agricultural residues and animal wastes) which accounted for 87% of the total energy consumed in the country. The impact that these consumption patterns are having on the forests of Nepal are realized when further statistics reveal that residents account for 98% of the traditional fuel source consumption and specifically, 89% is fuel wood (Asian Development Bank, 2006).

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Increased demand for this precious resource coupled with decreasing supply, makes for a grossly unsustainable practice as it is being depleted faster than it can be produced and supplied. This sort of deforestation within the country will prove to be devastating in the long term as the resource, without a doubt, will be completely exhausted and, related negative side effects that are often not considered will be exacerbated. These effects include increased soil erosion, desertification, loss of biodiversity, and negative impacts to land and watershed management. The culmination of these deforestation practices in Nepal only contributes to the global phenomenon of climate change.



*Figure 1: Biobriquette*

The bio-briquette is one technology that is a simple yet sustainable technology to be used as an alternative energy source in Nepal. Briquetting is the process of converting low bulk density biomass into high density and energy concentrated fuel briquettes. The beehive briquette is formed through partial pyrolysis, or charring, of various bio-mass including agricultural residues and forest waste vegetation such as the noxious weed, banmara grass etc. The charred biomass is combined with a limited amount, maximum 20%, of a suitable binding agent and placed into a mould that has approximately 19 holes to allow for proper combustion, thus the name, beehive.

Once dry, it may be ignited whereby it will burn for approximately 1- 1.5 hours with virtually no smoke being produced and is an efficient source of energy for household heating and cooking for a 5 member family. Using the bio-briquette for indoor heating is the most popular function of the briquette and the main reason that it is demanded by consumers both within urban and rural locations.

The Government of Nepal (GoN) has been also focused to promote the bio briquette as alternative energy sector. Various sectors including the government have put a strong emphasis on development of renewable energy development but due to the disintegration of efforts made by various agencies in the development of renewable energy, little has been achieved (Bahadur, Arjun, 2007). National Planning Commission's tenth fifth year plan that one objective for energy use in Nepal is to develop and expand alternative energy sources as powerful tools for alleviating poverty, raising purchasing power of the rural people by developing alternative energy technologies based on the local resources, increasing consumption of alternative energy and reducing dependency on imported energy through the proper utilization of local resources (GoN, National Planning Commission, 2007).

GoN has established separate organization as Alternative Energy Promotion Centre (AEPC) to supports energy sector development within Nepal. Currently, AEPC supports biogas, solar energy, micro-hydro and other biomass energy sources. The mandate of the AEPC is to promote the use of renewable energy technologies to meet the energy needs in rural areas of Nepal and acts as an intermediary institution between the operational level Non-Government Organizations (NGOs) and private promoters of renewable energy sources and rural communities. Certain alternative energy sources, especially biogas and Improved Cook Stoves (ICS), have been exemplary of successful implementation and utilization of alternative energy through the collaborated efforts of NGOs and Government; however, regarding AEPC's support to the biomass briquette, it is virtually non-existent. It is stated in the 2006 Subsidy Policy that "regarding other renewable energy, no subsidy has been provided but studies, research & development, trainings and pilot projects will be undertaken in the field of biomass briquettes" (Alternative Energy Promotion Center, 2008). The three years intrinsic plans 2007-2010 and 2010-2013 have also focused to promote the bio briquette as alternative energy in Nepal. IDS – Nepal is presently working on the promotion of community based beehive bio-briquettes made of banmara (*Eupatorium adenophorum*) in sustainable way. Awareness, dissemination, training, production and facilitation in marketing are the key activities of IDS-Nepal. At present, the program is conducting in the seven bio briquette producer groups of Lalitpur, Kathmandu, Banke; Tanahun, Gorkha and Kapilbastu districts.

Currently, the bio-briquette has available just in the market as alternative energy in littlies quantity in few department stores. The production of briquette is not considered as commercial purpose, it just produces to achieve the target of projects. The very few private companies are involved to promote marketing of the bio-briquette. The companies provide link between consumer and market, which are not sufficient to promote the market as commercial view. Continue development and support to the private companies for strengthening the partnership between company and producer and allow the companies to develop into a profit generating business.

### **Objective**

The bio-briquette is growing as an alternative bio mass energy source in Nepal due to deficit of biomass fuel during present scenario. There are certain challenges and obstacles that are inhibiting its production and marketing throughout the country. Therefore the main objective of study is to analyze the present market trends, growth, market size, market competition in the Kathmandu. The specific objectives are:

1. Identify and analyze the market trends, market price and market competition of bio briquette in the Kathmandu valley
2. Identify the demand and supply situation of bio briquette
3. Identify the market channel of bio briquette
4. Identify the challenges and opportunities of bio briquette in the marketing

## **Rational of Study**

Nepal is one of the highest biomass fuel consuming countries of Asia region where high dependency on traditional biomass fuels, mostly firewood. Nepal is following the trend of global energy use of rising and where total consumption for the decade ending 2000 grew at almost 13% per year while per capital consumption grew at 10%. These rates will continue to grow as the country develops, poverty levels decrease and the population becomes more comfortable. Thus, in the same manner that development, climate change and energy use go hand-in-hand. However, the current global energy system is unsustainable, not just in environmental terms, but also in economic terms. In Nepal where there is a severe shortage of energy, it is imperative that we find alternate and renewable sources of energy. Biomass briquette is one such renewable technology. It can be substituted for firewood in rural areas for use in cooking and heating. Pyrolized or beehive briquette is particularly well suited for rapid delivery to rural areas given its small scale technology that is easy to adopt and has very low capital costs. Environment change is becoming the most serious and urgent problem the world faces. Already, we have experienced disturbing changes to our climate. The vast majority of scientists agree that much of the change to the climate is man-made through our ever-increasing exploitation of fossil fuels

The benefits of using the beehive briquette are numerous as it greatly reduces Indoor Air Pollution (IAP) of homes, reduces the amount of open-flame related accidents, contributes to the reduction of deforestation in Nepal thereby maintaining the carbon sequestration within forests, the amount of CO<sub>2</sub> and SO<sub>2</sub> being emitted into the atmosphere, decreases incurred fuel expenses of communities and also improves the fertility of agricultural land as cow dung previously allocated to household fuel usage can be utilized in the field. Other benefits include social mobilization, product affordability, income generation, and capacity building for communities that partake in the local production process. Based on the benefits that are available to the producer and consumer, the bio-briquette has the potential to be a feasible and practical alternative energy solution for Nepal.

The beehive briquetting technology is simple, low emissions and eco-friendly. It provides an easily ignitable domestic fuel with sustained uniform combustion. The use of agro-forestry residues can replace fuel wood and wood charcoal. Being eco-friendly with high social relevance and having the potential to contribute to forest conservation, this technology could be widely promoted throughout Nepal. Banmara, by its name, the forest killer, is a weed which is available almost year round at no monetary cost and cannot be used a fodder as well. It has a tremendous negative impact on forest and therefore should be managed properly. Utilizing this banmara as a household energy for cooking as well as space heating in effective way leads sustainable livelihood. It does not only prevent deforestation, but also provides an ample income generation opportunity for the rural communities

Market analysis contributes to all the steps in a business from the initial determination of customer needs to final delivery of a product or service. Market analysis is used at all stages of product and business development, from conception and design through sales, delivery,

and follow-up evaluations. It is used to predict the potential demand for a technology, determine the impact of competing or complimentary waste management approaches, and identify specific market segments and customers and their needs. Market analysis can help predict the economic viability of the product or service prior to development, as well as identify product-design features that customers need. In the bio briquette sector, there is not study the market of bio briquette yet in considered the principles of market management. It has realized the study of bio briquette marketing to explore the actual market situation in Kathmandu.

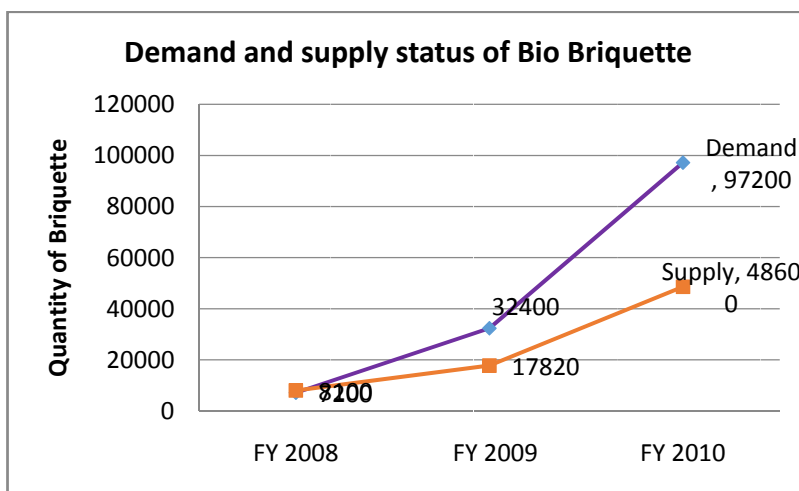
**Methodology**

The market bio briquette analysis study was conducted in the participatory way. The following processes/methodology was used for market analysis study.

- Consultation and discussion meeting with concerned stakeholders
- Structured questionnaire- Producer, market chain actors
- Key Informant Interview- Concerned Service provider (NGOs, GoN, Market agents)
- FGD (Focus Group Discussion)

**Finding**

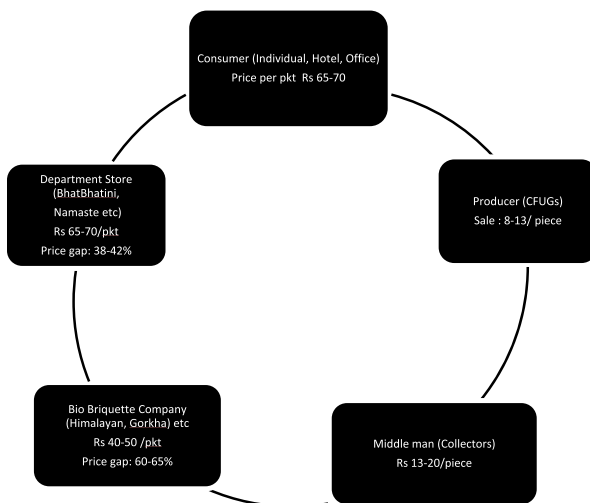
Demand and supply status: The study has shown the present condition of the demand and supply of the bio briquette market in the Kathmandu. The figure showing the market trends of Bio briquette during the period of three years (2008 to 2010). In the Figure, the demand and supply trend of the Bio Briquette has been increased gradually.



*Figure 2: Demand and Supply of the Bio Briquette*

**Market Chain Actors and Price:**

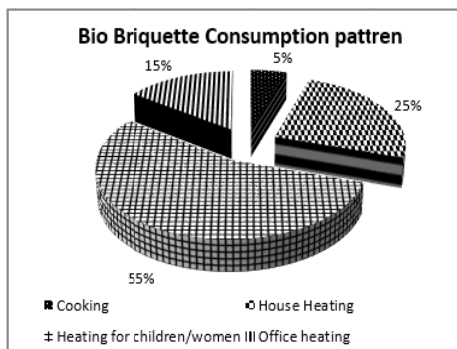
The following figure 3 is showing the different actors of the bio briquette market in the Kathmandu valley. The price of the bio briquette in the different layers of the market has found that the price difference is high fluctuation and very low price in the production level and high prices margin in the middle and retailers.



*Figure 3: Actors of the bio briquette market in the Kathmandu valley*

**Bio Briquette Consumption pattern:**

The study has focused on the analysis of the consumption pattern of the bio briquette in the Kathmandu. The following figure is showing the pattern of the bio briquette consumption pattern.



*Figure 4: Bio Briquette Consumption Pattern*

**Issues/challenges**

- Habitual use in community households
- Marketing
- Quality assurance
- Transportation/Marketing briquettes
- Seasonal availability of human resources and raw materials
- Lab Testing Burn Rate, different plants
- Costing

- Awareness and Technology Transfer
- Community Self Respect/Business

### **Opportunities**

- Technology improvement
- Commercial distribution and marketing
- Resource Center Development
- Livelihood enhancement through Briquette and carbon trading
- Development as alternative energy to fulfill the required energy
- Environment improvement and Biodiversity conservation

### **Conclusion**

The bio-briquette is growing in population as an alternative energy source in Nepal due to the interest, research and support of various local communities, national organizations and international agencies. Identifying and analyzing the lessons learned thus far in the bio-briquette sector is integral to the future development of the briquette and how the various stakeholders involved in the bio-briquette currently can contribute to the sustainable development of the Biobriquette as an alternative energy source in Nepal. Analysis of the bio-briquette thus far in Nepal identifies the many successes accomplished but also reveals the need for further promotion and support if the many stakeholders engaged in the bio-briquette sector are to overcome the present challenges existing in the bio-briquette sector. Therefore, the analysis of the achievements and challenges and consideration of the recommendations will enable NGO's like IDS Nepal and other local, national and international organizations to continue to develop and expand the bio-briquette sector. The bio-briquette has the potential to be a great alternative energy source for rural and urban communities throughout Nepal and through continued promotion, development and expansion, producers, consumers and others will be aware of the many social, health and environmental benefits of the bio-briquette and utilization within the country will increase.

### **Recommendation**

Bio briquette is one of alternative bio mass energy sources which are developing gradually as alternative sources of energy in Nepal. In order for the bio-briquette to expand and be developed as an alternative energy source utilized in this country, following realistically, feasible and practical recommendations are recommended for sustainable market management.

1. Capacity building on sustainable market management
2. Promotion of technology
3. Regular Monitoring for market
4. Easy access to Financial Support

5. Promotion of Private Companies
6. Promotion of value addition program
7. Diversification of size Bio briquette production
8. Effective government policy for business promotion:

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