

# Exploring New Holistic Livelihood Areas for Rural Sector – Framework & Strategy

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**Abstract:** For fulfilling the physiological needs; a livelihood system is essential. Lord Buddha also distinctly mentioned the importance of livelihood in the eight fold noble path advocated for ending of human suffering and happiness among human beings. In order to facilitate the exploring of holistic livelihood system, it will be necessary to define the word holistic and visualize the holistic livelihood for judicious use of natural resources in a renewable or recyclable manner. To fulfill appropriate physical needs of human beings is an important factor influencing peace and harmony.

The proposed work in this dissertation is based upon the identification of human needs and the holistic framework of livelihood. In the framework, highlighted the basic principles and guidelines through which the human needs can be fulfilled in sustainable manner. After this, studied the new areas of rural livelihood like for e.g. medicinal and aromatic plants extracts, Biomass briquettes, Apiculture, Food and vegetable processing units, Vermiculture, etc. In this part what are basics of new livelihood model, its manufacturing process, technology uses while operate, economics analysis, and what are constraints while implementing the new livelihood model is mentioned.

**Keywords:** Human Needs, Holistic Framework of Livelihood, New Areas of Livelihood, Medicinal and Aromatic Plant Species (MAPs), Biomass Briquette.

## 1. The Crisis of Modern Development and Pressing Need for adopting Holistic Livelihood

This can be easily observed through the fact that half of the world's population — more than 3 billion people — live on less than \$2.50 a day. More than 1.3 billion live in extreme poverty — less than \$1.25 a day. 805 million people worldwide do not have enough food to eat. [1]. With the time passes, our technology, lifestyle, need identification has become more accurate and prescribed. With more Population the pressure on natural resources has also been increased. One side, the livelihood practices of traditional rural economies has slowly getting vanished and another side new area of holistic livelihood are also emerging. So, to prevent the rural

unemployment, migration and exploitation it's necessary to visualize the holistic livelihoods on the basis of appropriate harnessing, recycling, of local natural resources.

## 2. Research Objectives

- (a) To identify the correct assessment of human needs on the basis of right understanding through which village can be self-sustained.
- (b) To identify the availability of natural resources present and visualize the holistic framework of livelihood for fulfillment of needs through available local natural resources.
- (c) To explore the new holistic livelihood areas for the rural sector.
- (d) To get acquainted with the some successful ongoing experiments regarding holistic livelihood.

## 3. Research Methodology

This is exploratory and analytical based research. In pursuance of the above objectives, first locate and study in detail relevant literature including interaction with experts. Through the literature review, we analyze the appropriate human needs & draw the holistic framework of livelihood. Then we have studied the some new areas of rural livelihood.

## 4. Review of Literature

**4.1 Renowned visionary's philosophy about rural development and holistic livelihood is as following:**

- Mahatma Gandhi had a clear perception of its villages and made an emphatic assertion that "India lives in her seven and half lakhs of villages". [2] Gandhi ji concept of rural development was based upon the trusteeship, swadeshi, self-sufficiency, khadi & village industry.
- J. C. Kumarappa highlights that we have made reserved spheres for religion, sociology and economy but nature does not recognize such division. The main objective according to Kumarappa's quest is to find our spiritual and 'higher-self'. [3]

- o Schumacher remarkable book ‘Small is Beautiful’ presents a stimulating critique of the modern (western) economic and technological development suggest a viable alternative calling it ‘Buddhistic economics’. [4]

#### 4.2 Understanding Traditional systems of India by Dharmapal and Ravindra Sharma

The main conclusion propounded by Dharmapal and Ravinder Sharma is that in order to appreciate our traditional heritage, it is necessary to understand the Indian ethos, beliefs, and worldview. According to Ravinder Sharma, the Indian tradition was based on recognition of human dignity and self-sufficiency. The economy was need-centric and locally managed.

#### 4.3 Literature Review from the relevant research papers

Robert Chambers & Gordon R. Conway [5] has firstly elaborated the concept of sustainable livelihoods in term of livelihood and sustainability. In conclusion, solution proposed for by the author is at need of work at the level of policy and research level. Lasse Krantz [6] has described the Sustainable Livelihood (SL) and compared the three SL approaches of UNDP, CARE (an NGO) and DFID. Rajalaxmi Kamath [7] has proposed solutions for effective implementation of NREGA is to be aligned with ground realities, underemployed in agriculture, increase awareness and participation of village communities in the planning & implementation.

Prem B. Bhandari [8] has studied that farm exit or livelihood transition and said that availability of working-age family members, particularly males are found to be important human capital that discouraged livelihood transition from farming to nonfarm activities. Raji Ajwani & Preeti Karmarkarb [9] has highlighted the NAIP initiative for improvement in livelihood in 5 backward districts of Maharashtra, India and proposes solution like Promotion of Water Resource Development, Seed production at farmer’s field, Promotion of fodder cultivation etc. for improving the rural livelihood. Eloise M. Biggs et al. [10] have highlighted with present livelihood scenario the food, water and energy are the key issues of future insecurity. Solution proposed in this paper is assist in ascertaining the balance between human demand and natural resource supply to achieve sustainability.

#### 4.4 Field visit at Tiny Tech Technologies Rajkot, Gujarat & interaction with Velji Bhai Desai

Velji Bhai Desai is a mechanical engineer of age 71 working who has work for rural technology since last 30 years. Velji Bhai explained the unemployment, hunger, exploitation, pollution, etc. are direct result

of heavy and centralized industry. In solution, he proposed that there has need of decentralization and family based economy. There is need of agricultural land holding, owned by a family which will be sustaining on that land. All are the owners of their profession, no laborer, no servants.

#### 4.5 Concluding Remarks:

Various philosophers have addressed that it is essential to ensure that the concerned community imbibes a holistic worldview. In the literature regarding the holistic livelihood there has absence of right assessment of human needs and holistic framework of development in term of harnessing the natural resources in a renewable and conservative manner. Along with that what are the new areas of holistic livelihoods in the rural sector which is not addressed in detailed manner yet.

### 5. Proposed Framework

#### 5.1 The Philosophical Worldview and Correct Appraisal of Human Needs

In order to move towards holistic and collective happiness, prosperity, there is need of comprehensive human goal. The comprehensive human goal may be visualized as follows:

- Peace and Harmony within an individual
- Prosperity and Harmony in the family
- Fearlessness and Harmony in the Society
- Mutually enriching and co-existence with Nature

**Table 1: Correct Appraisal of Human Needs**

Sr. No.	Major Needs	Availability of Local Resources
1.	Food products and fodder etc.	Agriculture, forest & animal products
2.	Energy needs in the form of fuel or thermal needs	Cow dung cakes, wood, charcoal, biogas from cow dung, etc.
3.	Other energy needs such as lighting and electricity	Solar-photovoltaic, biogas/producer gas engines, wind-turbine
4.	(a) Water requirement – drinking requirements (b) Water requirement – irrigation	Wells, Hand pumps, tube-wells with animal-driven pumps; ponds and other water bodies for rainwater harvesting, canals/rivers
5.	Agricultural inputs such as manure, pest control etc.	Biogas slurry, vermi-compost from all leafy and agro-waste etc.
6.	Clothing needs and	Cotton, wool from

	leather goods	animals, silk
7.	Transportation needs	Male animals, bio-diesel etc.
8.	Materials for habitat	Mud, stone, brick, lime, timber, bamboo, etc.
9.	Education & Skills Development	Schools, college, skills development centers etc.
10.	Utensils and implements etc.	Earthen pottery, metals etc.
11.	Medicinal	Herbal products from forest or cultivated

### 5.2 Self-sustainable village

According to Gandhi every person should be provided with bare minimum necessities i.e. food, shelter, and clothing. Self-sufficient village economy is where the villagers will be independent economic units. There are lots of definitions of Self – Sufficient village. As per the detailed study of literature the self-sufficient village according to our self are described as following;

The village community who are living in harmony, prosperity in every family, schooling facilities, irrigation facilities, no disputes, protection, enrichment and proper utilization of natural resources.

### 5.3 Holistic Framework of Livelihood

**Table 2: Holistic Framework of Livelihood**

1. Goal of production should be prosperity centric – not for accumulation
2. Design technology for the humans versus design humans for the technology
3. Technology should be – easy to handle and operation/ easy to maintain at user end level
4. Optimal participation and utilization of human and animal muscle power
5. Use of those natural resources which are present above the earth surface level only
6. production should be recyclable and mutual enriching in nature
7. Proactive & local self-governance facilitating development of all the people
8. Consumption rate of resources must be in balance with production

### 9. Popularization the use of renewable source of energy among peoples

### 5.4 Concluding Remarks

In this section, I have identified the eleven appropriate needs for the sustainable living of any rural area. After that with the help of literature study and exploration, I have drawn the nine guidelines of the Holistic framework of livelihood. This guidelines act like as an intermediate between the needs and the way of insuring the needs.

## 6. Proposed Strategy, Analysis & Discussion

### 6.1 Medicinal and Aromatic Plant Species (MAPs)

The WHO has reported that over 80 percent of the population in developing countries including India meets its primary health care needs through traditional medicine. [11] The Indian Systems of Medicine have identified 1500 medicinal plants, of which 500 species are mostly used in the preparation of drugs. Medicinal and aromatic plants (MAPs) possess the ability to grow in adverse conditions like i.e. poor soils and under low rainfall and moisture conditions.

**Table 3: Ten medicinal plant species have identified for promotion in the MAPs industry**

S r. N o.	Local Name	Botanical Name	Approximate Cost	Uses	Image
1.	Ashwagandha	Withania somnifera	Rs. 300 per kg	Stress relief, Improves memory, Good for general weakness	
2.	Aloevera	Aloe barbadensis	Rs. 400 per kg	improves hunger, cures nervous, constipation	
3.	Bhui aonla	Phyllanthus amarus	Rs. 200 per kg	An effective liver tonic	
4.	Brahmi	Bacopa monnieri	Rs. 300 per kg	Nerve tonic Improves memory, Help in Asthma	

5.	Drumstick	Moringa Oleifera pods	Rs.40-100 per kg	Reduces chances of cancer Improve eye vision	
6.	Van Tulsi Oil	Ocimum basilicum	Rs. 3,000 per litre	Anti-viral, anti-bacterial and anti-fungal, anti-spasmodic	
7.	Satawar	Asparagus racemosus	Rs. 1,000 per kg	Rejuvenator and health tonic, Increases appetite	
8.	Isabgol	Plantago ovata	Rs. 1,000 per kg	Anti-diuretic, Anti-acidic, Laxative	
9.	Kalmegh Powder	Andrographis paniculata	Rs. 200 per kg	Blood purifier, Cure of turbid liver, jaundice	
10.	Mulait Powder	Glycyrrhiza glabra	Rs. 400 per kg	Cold, diuretic, Intellect	

### Detailed Cultivation Technique of Aloe vera Medicinal Plant

The virtues of Aloe vera have been recorded for thousands of years by many ancient civilizations, including Egypt, Persia, Greece, India and Africa. It is a perennial plant, growing to the height of 1½ - 2½ ft. Its leaves are long and thick, juicy. There are over 250 species of aloe grown around the world.

#### Soil and Climate

Aloe vera is found to grow in hot humid and high rainfall conditions. It is grown in all kind of soils but well drained soil with high organic matter, is most suitable. It grows well in bright sun light.

#### Plant Protection

Not much problems of insect pests and diseases have been observed in this crop from any part of the country.



#### Yield

Harvesting of leaves starts after 7-8 months of planting. In India, the average yield for organically grown Aloe is about 12 tonnes/ha (on fresh weight basis). [12]

### Spacing and Planting

About 28000 – 34000 suckers are needed for one hectare planting. [13]

### Economics Viability of Aloe vera Cultivation

Expenditure to be incurred for Aloe vera cultivation normally amounts to about Rs.1, 10,000 / ha. The expected income with a yield of about 15 –20 tonnes would be about Rs. 340,000/ha. The net profit would be about Rs.2, 30,000/ha/years. In addition to monetary benefit, social benefit would be enormous. Better management can results in much higher income and net profit. [14]

### Recommendations for Development of Medicinal and Aromatic Plants

- **Intercropping System:** - Some medicinal trees will need gestation period of 8-10 years for economic production.
- **Post-Harvest Technology:** - The post-harvest technology for medicinal and aromatic plants is necessary since the plants after harvesting in green stage, if stored unprocessed for want of purchaser may get contaminated with fungi.
- **Marketing of Product:** - It is experienced that the farmers get convinced about the potential of profit from growing medicinal plants.
- **Primary Processing:** - Small processing units to serve the need of the cluster of villages will be a good idea. Small cost effective extraction unit should be developed and Government will have to support self-interest group of farmers for its establishment.
- **Conservation of Extinct Species:** - Many species which are grown in various forests / regions have medicinal value. Because of the constant harvesting required of these plants many of them have become rare.

### 6.2 Biomass Briquetting

Biomass briquettes are a biofuel which is used as substitute to coal and charcoal. As a typical example, about 800 tonnes of rice husk ash are generated every day in Ludhiana (Punjab) as a result of burning 2000 tonnes of husk. [15] Briquetting of the husk could mitigate these pollution problems while at the same time making use of this important industrial/domestic energy resource.

The major use of biomass briquettes in India is industrial applications usually to produce steam. Therefore, constantly rising fuel prices will be less influential in an economy if sources of fuel can be easily produced domestically.



Figure 1: Different types of Briquettes [16]

#### Advantages of using biomass briquetting

Briquettes produced from briquetting of biomass are fairly good substitute for coal, Firewood, and lignite.

- This is one of the alternative methods to reduce dependency on fuel wood.
- Briquettes are cheaper than coal and oil.
- Briquettes are easy to handle, transport and store.
- They are uniform in quality and size.
- There is no fly ash while burning briquettes.

#### Calorific Value

One of the most important characteristics of a fuel is its calorific value, that is the amount of energy per kg it gives off when burnt. The calorific value can thus be used to calculate the competitiveness of a processed fuel in a given market situation. The briquette made from press mud after drying and briquetting have calorific value 4000 Kcal. /Kg Approximately. [17]

#### Manufacturing Process

The biomass briquetting is simply a process of converting agro waste and forestry waste into biomass briquettes/bio coal. The biomass briquetting is the best renewable source of energy for healthy environment and economy.

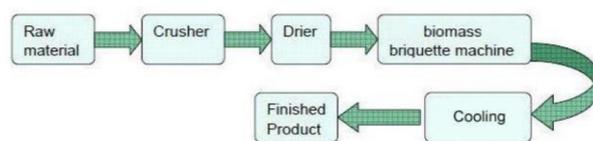


Figure 2: Briquettes Production Processes Flow Chart

Depending on the types of equipment used, it could be categorized into four main types: [18]

- (i) Piston press densification
- (ii) Screw press densification
- (iii) Roll press densification
- (iv) Low pressure or manual presses

#### Economic analysis of biomass briquetting

About 70 biomass briquetting machines were installed in India by 1995. By 2007 the number of briquetting plants increased to 250. As the technology is locally mastered and economically

viable, the number is increasing annually. Installing two machines each capacity 750kg/hr, land & machinery, raw material, power & labour cost, biomass briquette industry having the payback period of 2.5 years. [19]

#### Recommendations for development of Biomass Briquette

Incentives by the Government: - The Government of India has announced excise exemption, no license and also giving the subsidies for promoting this project for installing such plants to the entire printers engaged in developing alternative energy source.

- Tendency of briquettes to loosen when exposed to water or even high humidity weather
- Too high moisture causes steam formation and could result into an explosion. Suitable moisture content could be of 8-12%.
- Undesirable combustion characteristics often observed e.g., poor ignitability, smoking, etc.
- There has need to manually reject a large part of raw material by the shredder's operator to keep the quality insured. This way the raw material losses at 15% during the initial stage of the biomass.

### 6.3 Apiculture

Apiculture commonly known as beekeeping is the maintenance of honey bee colonies, in hives with the objective of producing honey and it's by-products.

According to Agricultural & Processed Food Products Export Development Authority (APEDA) of India, India has exported 29,578.52 metric Ton of natural honey to the world for the worth of Rs. 535.07 crores during the year of 2014-15. The Major Export Destinations (2014-15) are United States, Saudi Arabia, United Arab Emirates, Libya and Morocco. [20]

Its approximate composition [21] in percentage is as follows:

Water- 13-20%; Fructose 40-50%, Glucose- 2-3%, Minerals Traces Vitamins (B1, B2, C) - (minute quantities)

#### Uses of Honey and Beeswax

These main advantages of bee-keeping are as following:

- (i) Provides honey - a valuable nutritional food, rich in energy and vitamins.
- (ii) Medicines: It is used as medicine to prevent cold, cough and fever.
- (iii) Honey is helpful in reducing burn healing time.
- (iv) Honey also has a sweeter taste than sugar and this makes honey a better option than sugar for persons who are suffering from diabetes.

**Economics of Beekeeping: Unit [22]**

A. 50 beehives super (8 frames/beehives) + 50 stands  
= 2, 10,000 Rs.

B. Recurring & Working capital cost  
= 1, 86,000 Rs.

C. Production = 40 kg per colony, Total production  
(50\*40) = 2000kg

Selling price = 120 Rs./kg, Total Selling price  
(120\*2000) = 2,40,000 Rs.

Sale price of 8 frames/bee colonies/year  
(2400\*50) = 1,20,000 Rs.

Production of bee pollen =250 kg \* sale price 400  
Rs./ kg; = 1,00,000 Rs.

Total income generates =4,60,000 Rs.

Net income in first year after the C-(A+B) = 4,  
60,000 - (2, 10,000 + 1, 86,000) = 63,800 Rs.

Net income from the second year onward C-B = 4,  
60,000 – 1, 86,000 = 2, 73,800 Rs.

**Recommendation for development of Apiculture**

- Regular examination of colonies and availability of fresh water in the apiary
- Do the advance management of dearth period and care during honey extraction
- Protection of colonies from pests & bee diseases and store honey in stainless steel container
- Prefer to don't take honey from a colony in its first year and use registered medications.

**6.4 Food & Vegetable Processing Unit**

India is the second largest producer of fruits and vegetables in the world after China. It accounts for about 15 per cent of the world's production of vegetables. The area and production of horticultural produce is given in **Table 4**

Produce	Fruits	Vegetables	Spices
Production (Lakh MT)	812.85	1621.9	57.86
Area (Lakh ha)	69.82	91.0	31.0

(Source: National Horticultural Board 2012-13)

**Advantages of food processing compared to other income-generating activities**

- Availability of the raw materials is readily available makes food processing easy accessible to farming family.
- With food processing we can generate high profits from small scales of production.

- Small-scale production requires fewer amounts of investment that are affordable to farmers.

- When production expands, local metal workshops are able to manufacture many types of processing equipment, thus creating additional employment and income-generating opportunities.

- Properly managed small-scale processing has few negative environmental impacts.

**Strengths and opportunities that India enjoys In Food Processing Industry**

- • Due to its diverse agro-climatic conditions, it has a wide-ranging and large raw material base suitable for food processing industries. Presently a very small percentage of these are processed into value added products

- Demand for processed/convenience food is constantly on the rise

- Very good investment opportunities exist in many areas of food processing industries, the important ones being: fruit & vegetable processing, meat, packaged, convenience food and drinks, milk products etc.

**7. Salient ongoing experiment promoting rural livelihood in India**

**7.1 Success Stories of an Aloe vera and Drumstick Farmer**

Jakir Hussain of village Seoraderiya, district Howrah, is a progressive farmer of his locality. He has started to grow the aloe vera in his land. To meet the crop needs he also used organic manures / vermin compost etc. prepared by him. With the Total cost in 3 years of 3,75,000 Rs. he made profit of 7,19,766 Rs. [23] In addition, 5-7 small plants are obtained from each plant every year. Therefore, in 3 years about 15 small plants are normally obtained. The sale of small plant (Rs. 5/ per plant) per year / amounts to Rs.65, 625/-.

Santosh Sambhaji Kalane, of Village Balwant Station, Taluka: Sri Gonda, district Ahmednagar, Maharashtra, has created a record in the production of Drumstick. Drumstick is a perennial plant. Therefore one harvesting does not stop the necessary operation. It is expected to get higher yield in the second year. In the first year, a yield of 25 t / ha was obtained. With the total cost of 3,37,000 Rs. he made profit up to 2,72,000 Rs. [24]

## 7.2 Biogas model of supplying gas at free of cost to village of Ropar, Punjab

Entrepreneur Dalbir Singh, runs the biogas plant and has been supplying gas for six hours a day to all the 75 houses in the Bahadurpur village free of cost for over a year. R S Farm is a dairy farm maintaining the herd of 150 cows. 10 quintal milk is produced at the farm every day. [25] 10 thousand liters of cow dung along with cow urine is fed into the bio-gas plant and after processing the bio gas is produced. The produced bio gas is supplied to 75 plus homes in the village through pipelines. "If we fill the gas cylinders then approximately 10-12 cylinders/day will be filled easily," says Mr. Singh on approximate quantity of bio-gas produced at the plant every day. The plant runs 24/7 hence all through the year unlimited gas is supplied for free to all the village homes except four months in winters when it is restricted to 6 hrs/day.



**Figure 3:** A woman cooks using biogas at her house in Bahadurpur village. Tribune photos: Arun Sharma [26]

## 7.3 Converting Forest Fires into a Renewable Energy Source – Case study of Biomass Briquette

Rural Renewable Urja Solutions Pvt. Ltd (RRUSPL) located in the Garhwal region of the state of Uttarakhand is manufacturing and supplying biomass briquettes using pine needles, other forest residues and agricultural wastes.

Village self-help groups formed by 8-10 members (mostly women) collect biomass primarily comprising agriculture waste and forest waste including highly inflammable pine needles. Pine needle collectors are paid Rs. 1000 per ton of pine needles collected. This raw material is briquetted to a density of more than 650 per m<sup>3</sup>. 1.3 kg of briquettes replaces 1 kg of coal and 3 kg of briquettes replace 1 kg of LPG usage. [27]



**Figure 4:** Person adding raw material in Biomass briquette machine

## 8. Conclusion and scope for future work

In order to implement the holistic livelihood practices, it is essential that appropriate human needs of the rural area should be identified. Through research, try to identify the eleven appropriate human needs for the sustainable living of the rural area. On basis of literature review, proposed nine guidelines of Holistic framework of livelihood. In order to explore the new holistic livelihood areas, select the four new areas for rural sector which are medicinal & aromatic plant extract, biomass briquette, apiculture, food processing industry. As per the detailed study of context, manufacturing process, economics viability, constraints and recommendation of these domains of livelihoods, reached to this conclusion that all these four new areas of livelihood are the viable and profitable. They have potential to choose as option of livelihood for the rural sector. Except biomass briquette, all these livelihoods areas are small scale, less capital investment required, decentralized in nature, maintain natural life cycle. In biomass briquette high capital investment is required in form of purchase briquette machines. So biomass briquette can be good option of livelihood at town or district level. In Last, there are some minor constraints present in all new sector of livelihood but that can be solvable with proper planning and specialized guidance.

In future work, the detailed study of each area of livelihood can be done. The implementation of any one or two new livelihood areas in actuality on ground will also improve the results further.

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