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**JUGAAD- Not just “Making do” but a Low Cost Survival & Coping Strategy at the
Bottom of the Pyramids.**

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JUGAAD- Not just “Making do” but a Low Cost Survival & Coping Strategy at the Bottom of the Pyramids.

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Abstract

Till the recent times, Indian *jugaad* was another term for frugal innovation. Literally, it referred to the low-cost locally made vehicles used as a means of transportation in the rural India constructed as a result of the lack of resources and unhealthy financial conditions. The vehicle does not need any registration and is thus, also free from paying any road tax. Contrary to this, in the business and management literature, the term has much more added to its context. The paper discusses Indian *jugaad* as not only a way of “making do” but a methodology that has emerged as a way of survival for the people at the bottom of the pyramids. The lack of capital and resources causing the unaffordability of the basic amenities motivates the option of *jugaad* in the BOP. The paper mainly focuses on such *jugaads* that are taking place at the BOP level. Varying from a common BOP household to the entire chain of BOP entrepreneurship, the paper covers all the major innovations that have lifted the lives of these people. The paper discusses various physical *jugaads* involved in different sectors at BOP, such as a KUTCHA house, the cooking stove such as CHULHAs, and other small scale *jugaads* in the transportation, health, ICT and water. Some social and emotional *jugaads* involved in the sale and purchase of products concerned with the street entrepreneurship at the bottom of the pyramids are also highlighted in the paper. The paper also compares the physical *Jugaads* involved in housing, and energy to their actual urban model and discusses the entire pattern of the *jugaad*, including its construction, cost effectiveness at BOP. The approach to discover the innovations mainly includes research work at the grassroots level consisting of interviewing the people regarding these *jugaads*, analyzing its effectiveness and then comparing the entire scheme of things between a rural BOP household and a developed urban household. Some unethical *jugaads* are also mentioned in the

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paper common at the bottom of the pyramids. The paper finally concludes that a an individual at the BOP has to struggle his/her entire life and is left with no other option but to opt for such *jugaads* that are although not sustainable but are a way to earn them a livelihood, at the cost of life.

Introduction

According to *The Fortune at the Bottom of the Pyramids*, C.K. Prahlad, the four billion people living on less than \$2 per day refers to, what is called the Bottom of the Pyramids (BOP). These people consist mostly of the street hawkers, maids, construction workers and many such other categories. People at BOP are generally characterized by their low income, low literacy, low skills, limited infrastructure, limited resources and less freedom.

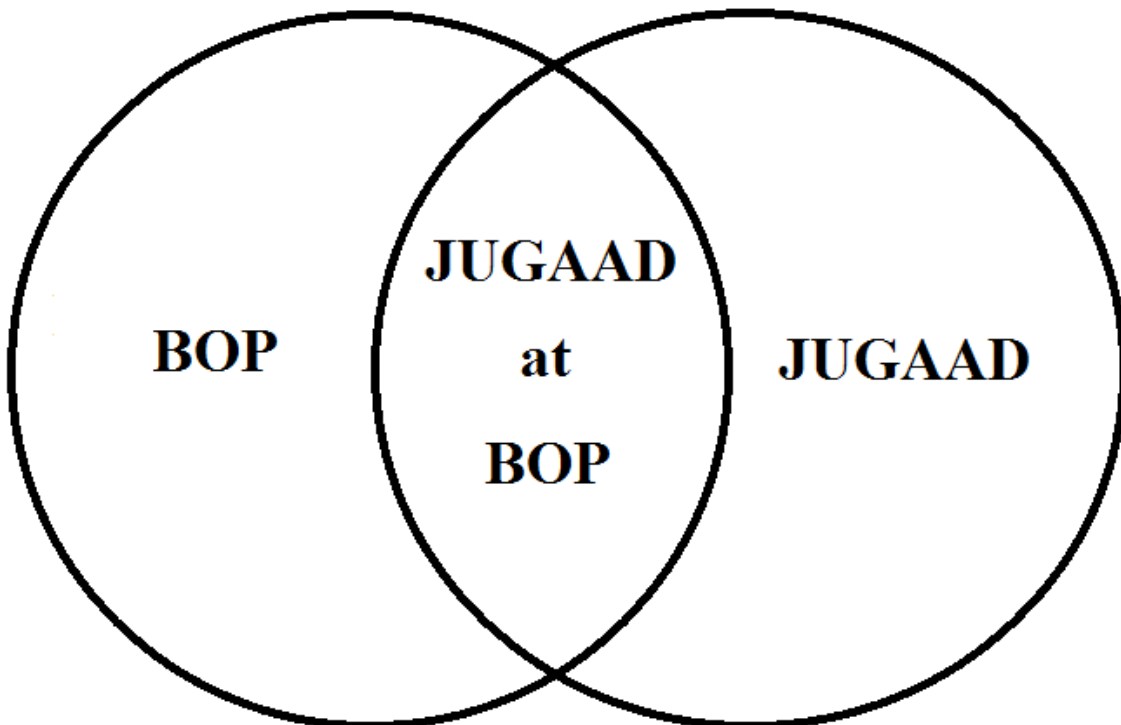
In India, traditionally *jugaad* refers to the cobbled together motorcycles, trucks, and cars that can take a larger number of passengers than a conventional car. Initially *jugaad* only referred to such vehicles, which are self made and specially designed in rural India and thus *jugaad* has been developed as slang for a 'quick fix' or 'making do'¹. This word has also been considered as an alternate meaning for the low level, borderline criminal activity in an informal economy². In social science, the term refers to bribery. However, in business and management, such practices are evolving as innate, grass root level innovations³ aroused due limited access to capital, resources and infrastructure. Till now, the *jugaad* was mainly considered as way to get some things done quickly, saving time. Using a small rubber piece to stop water from the ceiling instead of getting it repaired permanently, or traveling on the bus roof instead of waiting of a vacant bus. These are a couple of *jugaads* that are done on a daily basis just to preserve time. Some unethical methods such as selling of milk mixed with water or, getting a seat in a college even if the seats are full, are also the part of *jugaad*. Considering the overall concept, *jugaad* can be broadly regarded as a low lost innovation, a coping mechanism a quick fix solution and sometimes an unethical way of getting anything done.

¹ Mitra, B.S. (1995) India's Informal Car, *Wall Street Journal*, p.10

² Krishna A. (2003) What Is Happening to Caste? A View from Some North Indian Villages. *The Journal of Asian Studies*. 62(4), pp. 1171-1193. Available at: <http://www.jstor.org/stable/3591763?origin=crossr>

³ Mitra, B.S. (2006) Grass root Capitalism Thrives in India. *2006 Index of Economic Freedom*, pp. 39-47.

Through this paper, we aim to explore the *jugaad* taking place at the BOP as a consequence to their dilapidated resources, limited infrastructure and financial constraints. BOP has considered *jugaad* as a low cost innovation that suites their low income, acts as a coping mechanism with their limited resources. People at the BOP neither consider the ethicality of a *jugaad* nor do they do it to save time. The only prime and foremost reason for the *jugaad* at BOP is rooted to survival, and coping in the face of severe resource constraints.



The BOP population in India account to 924.1 million people⁴. A person at the BOP with a meager income is barely left with anything to afford after his daily expenses on food, shelter and other basic necessities and is therefore forced to choose the path of *jugaad* whether ethical or unethical. Sector-wise, food is the biggest BOP market (\$2.8-trillion), followed by energy (\$433 billion), housing (\$332-billion), transportation (\$179 billion), health (\$158-billion), ICT (\$51-billion) and water (\$20 billion)⁵.

⁴ Bottom of the pyramid market stands at \$1.2 trillion, Economic Times of India, 28th April, 2007

⁵ Bottom of the pyramid market stands at \$1.2 trillion, Economic Times of India, 28th April, 2007.

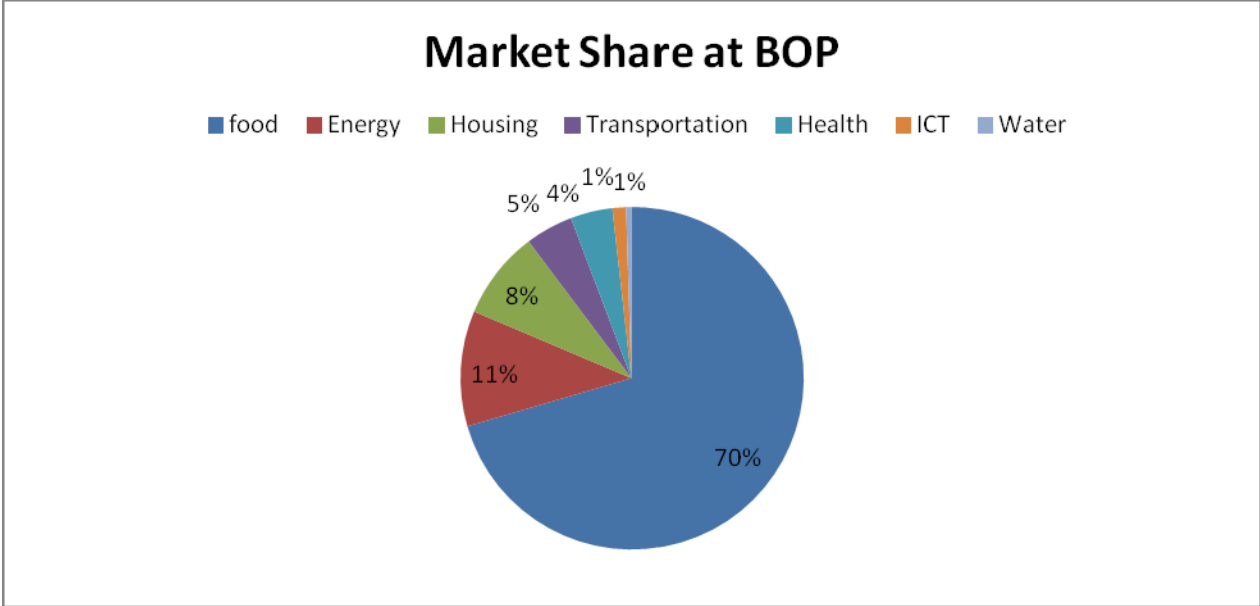


FIGURE 1. Percentage-wise distribution for different sectors in the BOP markets
 Food markets hold a majority of the share followed by energy and housing. Following them are the transportation, health , ICT and water competing closely. Source: Next Billion.

Therefore we have outlined the *jugaad* at BOP in a similar fashion, starting with the *jugaad* in food which includes the entire purchasing and consumption at the BOP from the consumer point of view, and the entire food market from the sellers’ point of view. We have categorized street entrepreneurship at the BOP into various groups and have discussed the entire financial side of these markets varying from expenditure on infrastructure to their monthly expenses on the selling products, electricity, transportation and other basic amenities. After food, *jugaad* in energy is discussed, which is mainly comprised of *jugaad* in the cooking fuels and cooking stoves. Following it is the *jugaad* in housing, constituting 8% of the BOP market. *Jugaad* in housing focuses on the infrastructure, bedding, and clothing. We have also discussed the entire economics of food, energy and housing sectors in detail. Towards the end of the paper, we have considered the common *jugaads* prevailing in the transportation, health, ICT and water. *jugaad* is observed in the BOP markets, both physically as well as socially. Social *jugaads* are commonly observed while bargaining in product costs, negotiating fares, and other public dealing.

According to the statistics, food and housing collectively owns a share of 78% in the BOP markets and thus the paper majorly focuses on these primary sectors. Through this paper, we

explore the entire insight of a BOP household discussing the necessity and the technique with which a BOP survives, being deprived of all the useful resources and financial. The paper aims at emphasizing the various *jugaad* that are being done at the BOP, which are not a “quick fix” but a way to sustain them in the society.

Jugaad in Food

A BOP household spends a maximum share of its income in the Food but due to the inadequate resources and financial constraints, a family at BOP is not able to enjoy all the food items and limits itself to the basic food categories only and thus an entire scheme of *jugaad* is observed in its purchase as well as consumption. *Jugaad* here, is not framed as a physical element, but is considered as an entire scheme of management that a BOP household does, to survive fulfilling its basic needs. Research and surveys convey that most of the BOP households cook only once a day, mainly afternoon. This cooked food is made for the lunch as well as the dinner and the left over after the dinner is consumed as the breakfast for the next day. Although the type of food does not vary much, *jugaad* is observed in the quality and quantity. Sometimes, the *jugaad* is also observed in the source of purchasing the food products. Our research highlighted that many people at the BOP do not have ration cards, but to cut down the cost of purchasing ,they *jugaad* these food items from a ration shop unethically , in “black”.

“ apko khane ki cheezo me zada farak nai dikhega. Farak bas uski quality aur quantity me a jata hai. Jahan aap log ₹ 40 ke chawaal khareedte hain, hum ₹ 20 ke chaawal se kaam chala lete hain. Aap hafte me 4 din meat khaa lete ho, hum ek baar khate hain” said a worker, working at a shop in Morigate, Delhi.

You will not find much difference in the type of food items. The difference is in the quality and quantity. Where you buy rice costing ₹40 per kg, we are able to afford it at ₹ 20 only. You are able to eat chicken 4 times a week, while we consume it once a week.

TABLE I**FAMILY AT BOP (MONTHLY INCOME 3,000-4,000)**

CATEGORY	EXPENSES(₹)
Rice	500
Pulses(mainly arhar, urad)	150
Vegetables(potato, onion mainly)	250
Flour	200
Non veg items	500
Tea	30
Milk	200
Other items (biscuits, cakes, noodles)	500
Fruits	100
TOTAL EXPENDITURE	2,430(60 - 80%)

FAMILY AT BOP (MONTHLY INCOME 5000-6000)

CATEGORY	EXPENSES(₹)
Rice	770
Pulses(arhar, urad)	120
Vegetables(potato, onion mainly)	300
Flour	100
Non veg items	1,000
Tea	40
Milk	130
Other items (biscuits, cakes, noodles)	500
fruits	200
TOTAL EXPENDITURE	3,160(50 - 60%)

NORMAL MIDDLE-CLASS FAMILY (MONTHLY INCOME 30,000-40,000)

CATEGORY	EXPENSES(₹)
Rice	1,500
Pulses (arhar, urad, massor, rajma, chole)	800
Vegetables(potato, onion various green veg)	700
Flour	250
Non veg items	3,000
Tea	500
Milk	1,000
Other items (juices, soft drinks, snacks, noodles, biscuits)	2,000
fruits	500
Bread and butter	500
TOTAL EXPENDITURE	10,750(25 - 40%)

Estimation of monthly expenditure on food at three different levels of society constituting BOP and middle class section.

People at BOP are observed to have a different sort of markets for their product purchases and are mainly referred to the street markets. These markets also involve a huge *jugaad* in physical terms as well as social, while negotiating prices and bargaining. We now focus on this market from the sellers' point of view at the BOP.

Jugaad in Food- Street Entrepreneurship

Due to the unhealthy financial conditions, unavailability of infrastructure and limited resources, street entrepreneurship is another *jugaad* that can be observed at the BOP. Street entrepreneurship basically includes the art of doing a business on the local streets, railway platforms, footpaths and earning one's livelihood. From a person selling a newspaper by the road side, or a person selling vegetables and fruits on a THELA, all comes under the street entrepreneurs. According to the hawker unions' study, 2005, there are 2.75 lakh inclusive of 1.10 lakh food hawkers with an annual business of 700 crore in the entire *hawker raj*⁶. Many of these street markets are based on the PAGDI system. According to the PAGDI system, the tenant has to pay some money to get the place (on pavement or a BOP market) vacated from the person who was already working on that. After this, the previous owner is not at all responsible for what so ever trouble does the new tenant faces, thereafter. It may vary from a few thousands to lakhs depending upon the place and the market. The price of a standard place on the footpath of Gariahat, Park Street, Camac Street markets varies from 1.5 lakh to 2 lakh, while the rate is around 1.5 lakh in Esplanade, Chowringhee markets⁷.

⁶ The times of India, Kolkata edition, 11th July, 2011, pg no. 2

⁷ The times of India, Kolkata edition, 11th July, 2011, pg no. 2



FIGURE 2. A series of *JUGAAD* stalls on the Tram line, Thakurpukur, South Kolkata

Our research on the street entrepreneurship is mainly focused on the BOP hawker markets such as a daily HAAT (small market) in PAILAN. PAILAN is a small place just 1.5 km away from the Indian Institute of Management, Calcutta. It is a permanent market, with the BOP people as the major sellers and the customers. The HAAT deals in various products ranging from daily grocery to clothes and attracts around 500-1000 customers daily. The market is a magnificent example of street entrepreneurship and expertise in the *jugaad* of street business. The PAGDI system follows here also with an amount of around ₹ 50,000 of a 5ftx5ft area. The research shows the variety in the kinds of hawkers that have wholly changed the meaning of business which was once only limited for a person sitting comfortably in his office.

Common hawkers in the PAILAN HAAT are “*Cubical Retailers*”. They generally have a small 5ftx4ft area covered with a plastic sheet supported by four bamboo sticks where they arrange all their products. Other also has small steel cubicles in which they have all the products they sell which generally come under a higher class of Cubical Retailers.



FIGURE 3. A seller in stall in PIALAN HAAT, Pailan, South Kolkata.



FIGURE 4. Sellers in Steel cubicals



FIGURE 5. A common *JUGAAD* tea stall, near ESI hospital, Joka, South Kolkata

TABLE II

TYPE	EXPENSES(₹)(including raw materials+ labor+ transportation)
Cubical(stainless steel+ glasses)	50,000
Stall(wooden blocks+ plastic sheets+ bamboo sticks+ tin sheets)	5,000
Small Stalls(plastic sheets+ bamboo sticks)	1,000

An approximate expenditure on building the different types of stall/cubical.

TABLE III

TYPE	PRODUCT
Stall (wooden blocks+ plastic sheets+ bamboo sticks+ tin sheets)	Fruits (all varieties)

INITIAL ONE TIME EXPENDITURE ON STALL

CATEGORY	EXPENSES(₹)
Infrastructure	30,000
Beam balance(mechanical)	800 (additional 300 per year for maintenance)
TOTAL COST	38,000 (additional 300 per year for maintenance)

MONTHLY EXPENDITURE ON STALL

CATEGORY	EXPENSES(₹)
Products	50,000-60,000
Transportation	3000
Electricity	90
Land rent	60
Other expenses	1000
TOTAL COST	54,150-64,150

Estimate one time investment and monthly expenditure of the “Cubical Retailers”.

The second area of research for street Entrepreneurship was THAKURPUKUR. It is a locality on the diamond harbor road near JOKA. The market here includes mainly the “*Marketers on Foot*” who just have a small place on the street where they sit along with the products he/she sells either in a basket or just placing them on the street. Some of these sellers have a *JUGAAD* covering of plastic sheet supported by bamboo sticks over their head while the rest just sits under the Sun for the entire day.

Aamtola, kobordanga theke maal niye aschi ₹ 50 van bhara diye, roj bhor 4 ter shomoy ghor theke beroi, maal kine ekhae aste aste shokal 8 ta beje jay,tarpor raat 9 ta shomoy chole jai,joto diner sesh hoye maal er dam komiye di dite hot,majhe majhe kena dameo diye di,abar noile kosto kore ferot niye jete hobe,tai r ki.Diner seshe motamoti 150-200 taka theke jay r ki “ said a vegetable seller in Thakurpukur market, Thakurpukur, South Kolkata.

I get the stuffs from Aamtola,Kobordanga. We use a Rickshaw van with a fare of Rs 50 every day. I stay here at Thakurpur market from 8am to 9pm.Normally at the end of the day, I sell all the remaining stuffs at a lower price, because it's a pain to take it back home. My net earnings at the end of the day is around Rs 150-200.



FIGURE 6. A vegetable seller in THAKURPUKUR market



FIGURE 7. A guava seller



FIGURE 8. A fruit (pineapple) seller depicting the "Marketers on foot".

“ami baruipur theke pyara kine ani, r THAKURPUKURE bajare bikri kori,ami ei pyara gulo 3 taka proti piece diye kine ene chi, amar ei 2 toi jhuri ache, r amra 4-5 jon mile gaari bhara kore mal ante jai, amra roj shokale bajar korte jai,r ekhane shokal 8 ta theke raat 10 ta obdi thaki.ami ekhane hotele kheyi ni ja khawar,kalke amar kono poisa otheni tai ogulo ajke kom e bikri korchu,dine amar khub bhalo becha kena hole 200 taka maximum thake.” Said a guava seller, when asked about his daily routine and the technique to sell the old products.

Every day I use to buy all these guavas from Baruipur market, and I sell it at Thakurpukur market. I normally buy it at a rate of Rs 3/piece, and sell at Rs 40 per kg, but yesterday I had a bad sale, so I am selling all those non fresh items at Rs 20 per kg and also mix some in the fresh ones. About transportation cost, there are 5 -6 sellers of different markets, we hire a Tempo everyday and get the guavas from the markets. At the end of the day I earn a maximum of Rs 200 and minimum it depends.

“Main yahan subah 8 bje a jata hun aur raat 10 bje jata hun. Meri dukaan me bag, joota, belt jaisi cheese milti hain. Agar din acha hota hai to 200 tak ki kamai ho jati hai warna to kabhi kabhi bony bhi nai hoti” said a cubical owner in Pailan Haat, South Kolkata

I open my stall at 8AM and close it by 10 PM. The main items in my stall include bags, belts, shoes etc. My daily earnings fluctuate. One day I may earn up to ₹ 200, while the other day I am not able to sell a single item.

“amra ei jayga ta government theke peyechi, amra kichu labour der bhara kore ei stall ti baniye chi, tara bash, tin, plastic r basher khacha diye eta baniye che.. amra tader ke 300 taka protti diner bhara diyechilam.” said the owner of a small tea stall in near ESI hospital, Joka, South Kolkata.

This place has been provided to me by the government, we hire laborers to build the stall using bamboo sticks, asbestos sheets, plastic sheets and bamboo sheets. We pay them Rs 300 per day to the laborers.

TABLE IV

TYPE	PRODUCT
Sellers (With Roof)	Spices

INITIAL ONE TIME EXPENDITURE ON JUGAAD STALL

CATEGORY	EXPENSES(₹)
Infrastructure	1,000
Electronic beam balance	4,500
TOTAL COST	5,500

MONTHLY EXPENDITURE

CATEGORY	EXPENSES(₹)
Products	40,000-50,000
Transportation	1,000
Electricity	75
Land rent	60
Other expenses	500
TOTAL COST	41,635-51,635

TYPE	PRODUCT
Seller (without roof)	Fruit (single variety- Guava)

MONTHLY EXPENDITURE

CATEGORY	EXPENSES(₹)
Products	15,000-30,000(depending on the season)
Transportation	1,500
Electricity	75
Land rent	60
Other expenses	600 (additional 400 yearly)
TOTAL COST	17,235-32,235 (additional 400 yearly)

An estimate of the monthly expenditure and initial expenses for “Marketers on Foot”.

The next category of vendors is tagged with the “*Business on Wheels*”. They just have their small quantity of products on a bicycle or some sort of a *JUGAAD* vehicle. Such hawkers do not have a permanent place for selling, and they keep on moving from locality to locality.



FIGURE 9. A Cocunut seller in the THAKURPUKUR markets



FIGURE 10. A sugarcane juice seller depicting the “Business on Wheels”.

Dialogue with a coconut vendor conveyed his entire schedule for the day. Every day early morning he goes to a coconut garden from where he buys the coconut for the day's sale. Then he reaches the market and starts his sale. The *JUGAAD* of selling follows here also, with selling the old coconuts at a less price or mixing it with other fresh ones.

“ami ei thakurpur er bhutore bagaan theke ,dab gulo niye aschi...bhattacharjee para,sil para,jora mandir ene thakur pukur bajare ese bikri korchi...ami sokal 7 tai ghor theke beroi....bajar aste aste 9.30- 10 hoye aji...theke 2 to 2.30-3 te obdhi thaki.. sokale 250 theke 400 takar mal kine ani.. roj sokale taka diye mal kini.. kono din beche gele bari niye chole jai,..abar porer din ese bikri kori... dine 40-50 ta dab bikri hoi... 100-150 taka income thake dine..tar moddhe dine 30-40 takar khabar kahi..hotele..ami thela gari ta aamtola theke kinechilam..7-8 bochor age..4-5 hazar diye kinechilam..” said a coconut seller in Thakurpukur market, Thakurpukur, South Kolkata.

I bring the coconuts from the gardens of thakurpukur i.e bhattacharjee para,sil para and jora mandir and sell it in thakurpukur market. I depart from my house at 7 in the morning and reach market by 9.30-10 and stay there till 2-2.30. i buy stuffs of around rs.250 - 500 every day and any remaining stuff I take it back home and sell it the next day. I sell about 40 - 50 coconuts every day, and my daily income is around ₹.100-150. I spend ₹ 30 - 40 for my lunch and all. Also I bought my selling van from aamtola about 7-8 yrs ago with ₹ 4-5 thousand.

TABLE V

TYPE	PRODUCT
Seller (with Cat Wheel <i>JUGAAD</i> vehicle)	Fruit (single variety- Guava)

INITIAL ONE TIME EXPENDITURE

CATEGORY	EXPENSES(₹)
<i>JUGAAD</i> Vehicle	5,000
TOTAL COST	5,000

MONTHLY EXPENDITURE

CATEGORY	EXPENSES(₹)
Products	12,000-15,000
Land	60
Other expenses	1000
TOTAL COST	13,060-15,060

An estimate of the monthly expenditure for the hawkers under the category of “Business on Wheels”.

The final type of street entrepreneurs common in the BOP markets are the “*Head and Shoulder Sellers*”, who are mainly common around the railways and bus stands. They roam from one place to another with their products on their heads or shoulder. The products may be supported by a bamboo stick or are directly carried on the head. Their expenses only include the products cost and the transportation cost and hence there is no initial expenditure on the infrastructure. These mainly include the food vendors, or the small toys or balloon sellers.

The first photograph⁸ represents a person serving a food item with just his utensil placed on his head, while the other photograph⁹ is of a boy selling coconuts with the basket on his shoulder.



FIGURE 11. A seller depicting selling food items with the utensil placed on his head.



FIGURE 12. A coconut seller with the tray on this shoulder

TABLE VI

TYPE	PRODUCT
Head and Shoulder	Coconut Seller

MONTHLY EXPENTIDURE

CATEGORY	EXPENSES(₹)
Products	2,000-3,000
Transportation	300
Tray and other expenses	200 half yearly
TOTAL COST	2,300-3,300(Additional 200 half yearly)

A common Estimate of the monthly expenses for the “Head and Shoulder” vendors.

⁹ <http://www.jonesi.com/catalog/i15.html>

Other *jugaad* in head and shoulder marketing includes the technique where a Shopkeeper places an employer working under him near the railway and bus stands. These employers sell the same products available at the shop, so that a passenger does not need to get off the train or the bus and the product is made available to him there only.

Another category can be added to the “Head and Shoulder” entrepreneurship that includes “*no cash in return*”. Such sellers are basically women selling utensils, and in return they ask for old clothes from the customers instead of money. They generally visit different residential localities for the sale. This is a pure innovative concept which is prevailing from quite a long time in the Indian markets.

***Jugaad* in Energy- Cooking Chulhas and Cooking Fuels**

In India, CHULHA is the primary traditional cooking stove used for indoor cooking. These traditional CHULHAs are prepared by collectively putting the mud bricks together and then a mixture of wood and cow dung is routinely prepared as a fuel for these CHULHAs. There is another type of CHULHA as well which uses coal as a fuel but it is hardly preferred in the homes because of the smoke they emit. There are about 160 million mud CHULHAs in India¹⁰. The following is a picture of a traditional Indian CHULHA.



FIGURE 13. A traditional Indian CHULHA common at the BOP

¹⁰ Low cost Chulha, Business World, June 6,2011

Although these people hardly care about the technical specifications of a CHULHA, but some such specifications do exist. CHULHA is a U-shaped mud stove made from local clay. After the clay formation is complete, it is finished by a coat of clay and cow dung mixture. The thickness of the walls is not important, but the dimensions of the fire-side are very important. There are no standard measurements. Over centuries, they have been optimized by word of mouth. A typical fireside cavity winds up with following dimensions

Width of the fire-side cavity = 7.5". This prevents cookware larger than 7.5" diameter from dropping in to fire side. Height from the floor of the fire-side to the bottom of the cookware = 7" approximately. The depth is approximately 11". The depth gives enough room for ventilation.

In the front there is an apron about one inch high and 5" deep. This apron helps hold the wood and later remove the ashes. The top of the apron is flush with the bottom of the fireside cavity. As a matter of fact, the CHULHA is constructed on a platform. A 3"

inch wall CHULHA will require a platform of 1" high, 14" wide and 19" deep. Wood and animal dung patties are used for fuel. Animal dung patties are called 'UPLA'. The kerosene or Ghee may be used as accelerator on wood or dung patties to start fire. An UPLA is a combination of animal dung (cows, buffalo, goat, sheep, camel, and excreta) mixed with finely chopped plant materials. The mixture is formed into patties (About 6" diameter and 1" thick) and dried in hot sun. The plant materials depend on the region and the crop being harvested. In North India, mustard stalks, legumes stalks, wheat straw are commonly used. The plant materials add to the density of UPLA and makes the fire last longer like charcoal¹¹

Research done in JOKA, South-West Kolkata, with some BOP people especially the maids revealed that most of them use CHULHAs as their primary source in cooking due to its easy affordability and making. The common fuels they use for the CHULHAs include wood and cow dung. Both of these are easily available in the nearby places. People collect dry wood (broken

"Hum log to CHULHA hi jalate hain. wo hume sasta bhi padta hai, aur uske lie lakdia bhi aaram se mil jati hain. Gas kharidne ka paisa nai ho pata hamare paas." said a Maid working in GENEX valley Apartments, Joka, South Kolkata.

"We use Chulha as it is cheaper to us and the wood for it is also easily available. We are not able to afford Gas."

¹¹ <http://www.indiacurry.com/faqappliance/traditionalstoves.htm>

from the trees) from the nearby parks, gardens or small jungles. They collect it for a week and ghee same schedule is repeated. They often buy some wood depending on the requirement.

The combination of wood and cow dung has a very high calorific value. Cow dung does not burn easily by itself and thus it is used in combination with wood. The data collected showed that the wood costs them around ₹ 3-5 per kg, while the cow dung cakes costs ₹ 10 per 100 cakes. Also the statistics shows that an average of 40-60 kg of wood and 100 cow dung cakes are enough for a month for a single household. Research also tells that 3-4 kg of wood is sufficient for a day's cooking and the burnt wood is also used on the other day along with some fresh wood. The waste/ash remained after cooking is also very useful in washing utensils.

A normal household makes food twice a day along with tea twice a day. A common food includes a daily consumption of rice and pulses, while the fish and chicken are made once in 15 days. So it is estimated that a house spends around ₹ 150-200 on fuel in a month depending upon the family members and the usage.

On the similar grounds, the survey tells us that a same household, if uses a LPG cylinder as fuel for cooking, it costs him an amount of ₹ 400-450 per cylinder. While kerosene as a fuel costs ₹30 per litre and its consumption varies from 15 litres a month amounting to an expenditure of ₹450.

TABLE VII

Stoves	Fuel	Calorific Value	Cost(₹)	Requirement (per month)	Estimate Monthly Exp(₹).(when bought)	Sources
CHULHA	Wood	14-17 MJ/Kg	3-5/kg	40-60 kg	150-200	Nearby jungles and markets
	Cow Dung	16-19 MJ/kg	10 per 100 cakes	100 cakes	10	Nearby places
Gas (LPG)	LPG	46.1 MJ/Kg	30/Kg	1 cylinder(14.2 l)	400-450	market
Kerosene	Kerosene	35 MJ/l	30/l	15 l	450	market
Coal CHULHA	Coal	15 MJ/Kg	9/kg	30 kg	270	market

Different types of cooking fuels , their market prices, monthly requirement and monthly expenditure in the BOP household.

Hence it can be concluded that a BOP household's *jugaad* of CHULHA is profitable on economic grounds also.

After all the benefits, a major concern which still prevails is the smoke inside the house created by burning wood, dung, and crop waste. It may cause acute respiratory, ear, and eye infections. Smoke can cause breathlessness, chest discomfort, and headaches. It can be fatal for children. As a solution to this problem, nowadays many CHULHA are built under a chimney to take the smoke out of the kitchen to the roof. These chimneys do not have an exhaust fan. The smoke rises naturally and escapes from the Chimney. Newer designs incorporate a filter to trap toxic particle vent pipe with filters made of slotted clay to trap toxic particles. These filters are located near the CHULHA and can be easily accessed for cleaning¹².

Jugaad in Housing- Infrastructure, Bedding and Clothing

The most important *jugaad* in the lives of the bop households is in the housing. Due to their very less income, these BOP people are not able to construct a permanent house for themselves. Rather they are forced to *jugaad* a KUTCHA or a semi KUTCHA house for themselves.

“On interviewing a tea seller, who sits outside the ESI hospital in JOKA, South Kolkata, she told us that her monthly income is ₹ 3000, out of which most is spend on the food products and the studies of her daughter. After that, they are not left with even a penny as the savings, and following these circumstances, they are never able to afford a permanent Pucca house”.

A KUTCHA house is a temporary type structure made of crude materials such as mud-clay un-burnt bricks, bamboos, grass, reeds or thatch¹³. These Mud houses are easier to build, repair and maintain and are inexpensive. The basic raw materials for such houses include bamboo sticks, bamboo sheets, rubber tyres, plastic sheet, and mud. Following is a picture of a common wood and bamboo shop, which mainly deals in building such KUTCHA houses.

¹² <http://www.indiacurry.com/faqappliance/traditionalstoves.htm>

¹³ <http://answers.yahoo.com/question/index?qid=20080105144812AA6MrYh>



FIGURE 14. A common wood and bamboo shop in Chowrasta, Behala, South Kolkata

According to the 1991 Census, the rural housing 10.31 million living in KUTCHA houses. In terms of roof type, the percentage of houses having grass, straw and thatch is about 33%, mud and unburnt bricks 6.05% and tents 4.22%. Apart from this, in terms of quality of walling, 47.27% of the total households have grass and straw walls and about 4% have tent and cloth walls. Nearly 70% of the rural houses are either unserviceable KUTCHA (9%) or serviceable KUTCHA (25%) or of semi-PUCCA (35%) category as per Census 1991. Similarly, According to the National Family Health Survey, concluded in 2000 by the Indian government, only 19% of the rural population lives in *PUCCA* (strong) houses, while the remaining live in KUTCHA (weak) and *semi-PUCCA* houses with mud walls and thatched roofs. The two main types of roofs at the BOP level are the one having grass, straw and thatch while the other made using mud tiles and unburnt bricks¹⁴.

¹⁴ <http://www.drdacachar.org/programs/iay.asp>



FIGURE 15. A common roof made of straw, bamboo sheets



FIGURE 16. A roof made up of mud tiles and unburnt bricks

If one goes into the economics of making such houses, the data collected from interviewing the BOP people reveals that the bamboo sticks of a standard size (30 ft) costs around ₹ 130-150 per stick. The bamboo sheets and the plastic sheets cost ₹ 10 per sq. ft and ₹ 60-70 per kg respectively. The buildings of such KUTCHA houses include initially the flooring using mud. While bamboo sticks and sheets are purchased from the market, mud is collected from nearby places and there is hardly any expense in that. The labor is given the size of the land and accordingly they prepare the bamboo sheet for the walls. After that the roof is made using bamboo sticks and bamboo sheets. The roof is finally covered with the plastic sheets to provide strength. Nowadays roofs are also building using mud tiles, which cost around ₹ 5 per piece.



FIGURE 17. KUTCHA house's wall made up of unburnt brick



FIGURE 18. a wall of a KUTCHA house made up of bamboo sheets



FIGURE 19. a wall of an urban pucca house

TABLE VIII

Raw materials	Cost per unit(₹)	Unit required	Total cost(₹)
ROOFING			
<i>TYPE 1</i>			
Bamboo sticks	135 per stick	20 sticks	2,700
Plastic sheets	70 per kg	10 kg	700
Bamboo sheets	10 per sq ft	100 sq. ft	1,000
Asbestos Sheet	25 per 2.5 sq ft	100 sq ft	1,000
<i>TOTAL COST</i>			5,400
<i>TYPE 2</i>			
Mud tiles	5 per piece	300 pieces	1,500
Plastic sheets	70 per kg	10 kg	700
<i>TOTAL COST</i>			2,200
WALLS			
<i>TYPE 1</i>			
Bamboo sheets	10 per sq ft	4x100 sq. ft	4,000
<i>TYPE 2</i>			
Bricks(lower quality)	3 per brick	2,600	7,800

FLOORING			
Mud/sand	3000 per 100 c ft	50 c ft	1,500
OTHER EXPENSES			
labor	300 per day	5 days	1,500
transportation	200 for one delivery	5times	1,000
TOTAL COST			2,500
OVERALL COST (ROOF+WALL)			ROOF + WALL+ FLOORING + OTHER EXPENSES= OVERALL COST
TYPE 1 + TYPE 1			5,400+4,000+1,500+2,500=13,400
TYPE 1 + TYPE 2			5,400+7,800+1,500+2,500=17,200
TYPE 2+ TYPE 1			2,200+4,000+1,500+2,500=10,200
TYPE 2 + TYPE 2			2,200+7,800+1,500+2,500=14,000

The estimate expenditure in building a 10ftx10ftx10ft room common at the BOP (Cost of paint and other furniture work is excluded).

It can be seen that the total cost varies around ₹ 10, 000-20,000. On contrary, if we compare the same size urban housing, it will amount to around ₹ 60,000-70,000. Hence it can be seen that the *jugaad* made by the BOP people really is a low cost innovation. Also a general BOP house is only this much big, while an urban common house has 3 to 4 such 10ftx10ftx10ft rooms along with other expenditures on plaster, paints etc.

TABLE IX

Raw materials	Cost(₹) per unit	Unit required	Total cost(₹)
Bricks	6 per brick	2,600 bricks	15,600
Cement	360 per bag	25 bags	9,000
Sand (fine)	30 per cft	For 1,000cft	6,000

Labor Mason	1,000 per person	5 persons for 3 days	15,000
electricity			10,000(material)+5000(labor)=15,000
plumbing			5,000(material)+2,000(labor)=7,000
OVERALL COST			67,600

The Cost estimation of building a 10ftx10ftx10ft room using the urban technique. (Cost of paint and other furniture work is excluded).

A common BOP house lacks the basic hygienic facilities. 87% of homes in the villages does not have toilet facilities. Also Cooking is usually done inside the house under inadequate ventilation with biomass such as dried cow-dung, fire wood, dry weeds or crop residue, exacerbating the risk of tuberculosis. This is the second major *jugaad* done at the BOP level. The 2001 Indian Census estimated that 40% of rural houses do not have separate kitchens¹⁵. When cooking is done inside the house, it is usually on the floor in the corner of a room, sometimes separated by a half-wall. Smoke fills the entire house during cooking, but occupants usually prefer to remain inside. Coughing and spitting are the resulting outcome, symptomatic of what finally leads to chronic illnesses.

Of course there are many disadvantages associated with the use of mud. It has low strength, does not grip wood properly leading to gaps around doors and windows, and soaks up water causing cracks and leaks in roofs. Mud is easily eroded by water which makes it difficult to use in areas with heavy rainfall. It is also susceptible to mechanical

“hamara ghar to baas ka hai. Zameen mitti ki hai , jo hume aas pass se mil jati hai. Par hamare ghar me bijli aur bathroom ki koi suvidha nai hai.” said the rickshaw puller of Bihar origin, working in Behala, South Kolkata.

“My house is made up of bamboo. The flooring is of mud, which I had arranged from nearby places but my house does not have comfort of electricity and bathroom. “

¹⁵ <http://knowledge.wharton.upenn.edu/india/article.cfm?articleid=4219>

damage, making it easy for rodents to dig holes into mud walls. Similarly bamboo is a non-dimensional material and does not often come with uniform shape, size and age. Raw bamboos cannot resist all kinds of weathers. Especially they are likely to deteriorate in cold dry climates. If bamboos are not treated well then they are highly vulnerable to fungus and termite attacks¹⁶. Due to the light weighted straws, mud bricks, these houses are also highly prone to natural calamities such as earthquakes, floods etc. numerous such examples can be cited.

The other common *Jugaads* in the BOP take place in the categories on bedding, clothing, and water and money storage. Traditional BOP households does not have a proper bed to sleep and hence they *jugaad* a KHAAT¹⁷ and MADHUR as an alternative for it. A Basic KHAAT is made up of a frame made up wood, entirely covered with the ropes. A normal KHAAT costs around ₹ 500 while a MADHUR costs ₹ 250. They are a genuine low cost innovation as compared to an urban style bed which costs around ₹ 10,000.

Moving on to the financial security, a common urban household surely has a bank account , along with the credit and ATM cards and thus hardly carry any cash with himself or at home, but this is not the case with a BOP person. A major proportion of them do not have a bank account as they hardly have any savings end the end of the day. Their daily routine includes working the entire day and then spending that amount fulfilling the daily basic needs such as food etc. A minimum savings that a BOP household has, they *jugaad* it, either by keeping it beneath the MADHUR (CHATAAI), or bury it beneath the mud flooring because of the high chances of theft. A very few families at the BOP exist having a bank account. Talking to one such Madrasi family, working in a house in Delhi, they told that the only reason for them to have a bank account is so that they do not have to carry the money when they visit their village in Chennai. They deposit their savings in the bank and withdraw them from their Chennai bank account. Other than this, they hardly deposit any money in the banks. Some families also place their savings with the person, under whom they work, so as to prevent the money from been stolen.

¹⁶ www.123eng.com/projects/mud%20architecture%20chapter%204-5.pdf

¹⁷ <http://www.design-flute.com/2007/07/09/charpoy-the-art-of-sleeping/>



FIGURE 20. A Traditional KHAAT



FIGURE 21. A CHATAAI in a BOP household



FIGURE 22. Chowki in a BOP house in GOLF GREEN, Kolkata

The last major *jugaad* at the BOP level is found in the clothing. The *jugaad* in clothing varies in its physical as well as social aspects. A BOP family often *jugaad* clothes from the place where they work.

“hume to un gharo se kapde mil jate hain jahan hum kaam karte hain.jaise unke bete ke kapde agar chote ho jate hain to wo hume de dete hain. Humara guzara usi se ho jata hai” said a maid, working in a house in PitamPura, Delhi

“ We get clothes from the houses where we work. Like when the clothes of their children become tight or old, they will them to us. We live off with that.”

Most of the families at the BOP are able to *jugaad* clothes from the places where they work. It includes the old, tight clothes of the children of those people. The families at BOP only buy clothes on the religious festivals such as Durga Puja, Pongal, Diwali, once or twice in a year from some *jugaad* shops by the roadside or pavements. Apart from this, the range of cost in the clothing also differs tremendously in comparison to an urban middle class household. Another *jugaad* in clothing is the passing on of the clothes from one of the siblings to another in a family. This is also considered as a tradition in India.

Jugaad in luxury is also observed in a BOP household. Due to the financial constraints, an individual household is unable to afford luxury items such as a television. Hence they *jugaad* the option of “*community owned assets*”. The entire community of the area, collectively buys the

item (mainly television), by contributing a fixed amount. The television is then safely placed at a location that is in the heart of that area and the entire community enjoys the luxury together

Talking to a sweeper in Delhi, he came across with the entire framework. He told that the television is placed at some shop near the *Chaupal*. Chaupal¹⁸ is a place, somewhere in the middle of the area, where all the people come together for the evening talks, morning discussions. Television is only operational at the time of any cricket match, or if any tragedy/incident has taken place in the country.



FIGURE 23. A BOP clothes market



FIGURE 24. A BOP market in JADHAVPUR, KOLKATA



FIGURE 25. CHAUPAL in a village

***Jugaad* in Transportation**

Unable to own their private vehicles, people at BOP have to *jugaad* their own ways of transportation. *Jugaad* in transportation mainly involves the scheme of managing their travel, journey in the least amount possible unlike a middle class family, preferring an auto, or a private transport such as a motorcycle or a car, even for small distances, people at BOP consciously spend on their travels. Talking to some people near Chowrasta, Behala, South Kolkata, maximum of them revealed that they prefer to walk, if the destination is 1-2 kms, otherwise take an auto, which is the cheapest mode of transport to them in Kolkata. On the contrary, it is commonly observed that a normal middle class person hardly prefers walking down a kilometer and rather drive there in his/her private vehicle or take an auto or rickshaw. While at the BOP,

¹⁸ http://animalhusb.up.nic.in/anim_people.htm

concern on hiring a mode of transport is regarding money, it is the comfort which is preferred at the middle class.

Jugaad in transport can also be observed physically, varying from *jugaad* vehicles, common in the rural areas of the country, to some small scale *jugaads* done in the other public transport systems saving time and money effectively.

Jugaad vehicles are a low cost public transport system, common in the rural areas, used to carry a large number of passengers, mostly exceeding its capacity. These vehicles cannot be registered and hence do not require to pay any road tax, and other taxes that are imposed on other registered vehicles. They are made with a highly skilled technique of arranging an entire frame on the vehicle, to accommodate as many passengers as possible, and are mainly run using diesel engines. Although, the vehicle involves high risk of injuries, it has become a part and parcel of the daily life of the people at BOP living in the villages.

The concept of shared autos is also emerging as an effective way of *jugaad* nowadays, and has efficiently able to save time as well money for the passengers daily travelling in these autos. Instead of hiring an auto of one single destination, people now prefer to take a shared auto, which passes by different stops according to the passengers sitting. This has resulted in a decrease in the long queues near the auto stands and has also lower down the fare charged from a single person. A *jugaad* to accommodate larger count can be observed here as well, with the auto owners coming with the concept of arranging seats alongside the drivers' seat. A common auto is capable of carrying three passengers at a time, while such a concept has able the drivers to accommodate 5-6 passengers at a time.

A small scale but highly efficient *jugaad* is also seen in the ricksaws at the times of monsoons. With no roof, ricksaw pullers generally find it difficult to ride during the rains. Also a high risk of diseases accompanies them in such weather. Thus the ricksaw pullers have come up with a idea of arranging a plastic sheet supported on a bamboo stick or an iron rod, as a roof cover for their ricksaw and thus preventing them from being wet and catching various dreadful diseases.



FIGURE 26. A traditional rickshaw in Kolkata with a *jugaad* roof.



FIGURE 27. *Jugaad* in seating arrangement in an Auto



FIGURE 28. A *jugaad* vehicle common in rural areas.



FIGURE 29. A "Haath-Rickshaw" mostly found in Kolkata

***Jugaad* in Health**

Jugaad in health is quite profound with respect to the money saving point of view. Throughout the interviews, it is noticed that the people at BOP do not really care about the duration of treatment, but they prefer to go to the government hospitals with a bare fees of ₹ 30 or so. It is observed that this initiative is also taken in the worst scenario; otherwise they prefer to go to the chemist directly and take some medicines without any prescription.

The situation is totally opposite in case of kids, as the parents at BOP as well make sure the best treatment affordable for their child , along with getting all the preventive vaccinations in due time.

In the worst scenario of a major disease, the families at BOP are left with no other option but to *jugaad* a loan or ask for money from where they work. Loan also includes a fully fledged *jugaad* in it, as these families do not have the required documents and are not able to fulfill the other formalities.

Any sort of medical insurance or life insurance is very rare at the BOP, as they are left with no money for the monthly or yearly premium, they need to deposit. Although the government is coming up with the various schemes, to provide better health services at the BOP, but still these facilities have not penetrated to the grass root level at the BOP.

Jugaad in ICT– Mobile Phones

The mobile phones are penetrating rapidly deeper and deeper and now have become a part of life for almost every person. People at BOP are also affected from it at the same time. Study shows that apart from a low quality hand set, *jugaad* is mainly observed as a way to manage the balance, and stretch that one recharge to its maximum limit, before recharging it again. On interviewing some BOP people in the area of Shaker Bazar, South Kolkata, it was discovered that most of them have a lowest quality hand set ranging from ₹ 500 – 1500. Maximum mobile phone owners at BOP *jugaad* a second hand mobile phone. As far as recharging the number is concerned, a recharge of ₹ 20 -30 is enough for at least 9-10 days. Their only contact through phones is with either their family or some relatives. Most of the families at BOP have an effective *jugaad* in which they convey their messages to their families i.e. through the missed calls.

“main jab subah apni ma ko miss call karta hun, to uska matlab hota hai ki main apne kaam par pauch gya hun aur jab sham ko karta hun, to uska matlab hota hai ki main ghar ke lie nikal gya hun. Isse mera kharcha bhi nai hota aur baat bhi ho jati hai.” Said a boy working at a tea stall.

When I give a missed call to my mother in the morning, it means that I have reached my place of work and when I do the same In the evening , it means I have left for house. With this I save my money on mobile and get the things done.

An average person at BOP only interacts with his/her family throughout the day, and the only expenditure comes, when they have to talk to their relatives or in any emergency and thus are able to *jugaad* an efficient way to use it with minimal expense possible. *Jugaad* in saving the mobile balance also includes switching of the mobiles. At the BOP, illiteracy is a major concern and affects people in some way or the other. Marketing calls is a common phenomenon in all the network companies and the inability of the people at BOP to understand the call; they sometimes fall prey to these calls, resulting in deduction of balance amount for some reason of the other. Therefore to avoid this, they need to switch it off and only use it to contact their families or in emergency.

Jugaad in Water Usage & Storage

A fully fledged *jugaad* in water collection, consumption and storage can be studied at the BOP. Contrary to the urban system of water meters, monthly bill, and individual taps in each house, the process at the BOP goes all together differently.

Water arrangements in the BOP locality are made by the municipal cooperation of the state with every street in the locality having a municipal tap. There is an entire schedule for the water availability in the taps with one day allocated to each street. Once all the streets are covered, the cycle continues. Therefore every street gets water weekly, or once in 10 days. Every street has around 10-15 houses, and all these houses are required to collect the water on the prescribed day. Water is made available twice a day for a total duration of 8 hours. All the houses, with self understanding, get their chance. A family requires storing water for the entire 10 days before their next chance follows. People at BOP use different types of containers, bottles, jars to store water. A traditional MATKA is also observed for storage, to keep water cool in the summers. If a family gets over with its entire stored water before its next date comes, a person from the family wakes in the night and obtain the required amount when water is available for an hour, mostly after midnight, everyday.



FIGURE 30. Women filling water from the Municipal tap near Golf green, Kolkata



FIGURE 31. Different types of containers for water storage.



FIGURE 32. A traditional MATKA to store water in summers.

The consumers are not required to pay any monthly bill or any sort of money for this, as the water is made available free of cost by the municipal cooperation. Sometimes the conditions may vary according to the number of houses and the frequency of water availability.

Social Jugaads

Jugaads are not only confined to the physical components, but also has the social aspects which mainly involves the strategy a common seller in the BOP markets adopt to sell his product through negotiating prices. a similar stand is also observed from the customers point of view, who indulge in the supreme level of bargaining in such markets. On interviewing one fruit seller in the PAILAN HAAT, this is the description of how he attracts the customers

Bargaining in the BOP markets is a common trend, which is familiar to both the customer as well as the seller. Now the *jugaad* is seriously observed in the conversation between them, when the seller tries to maximize the profit, and the customer trying to get the price as low as possible while making sure that he/she buys the product.

“akta customer jokhon dekhi akta dokan theke beriye asche, tokhon amay take capture korte hobe, capture ta ki kore? jodi o chollis taka (rs 40) rate bole, tokhon ami take poi tirish(rs 35) bole prothom chotkay take dar korate, tarpor 2-4 din kom nite nite abar 40 taka rate ta tar opor niye nite hobe”. Said a fruit seller in Pailan Haat, Pailan, South Kolkata.

“When I see a customer going to another shop, from where she does not buy anything, I try to capture that customer. Let’s say if he has offered a price of ₹ 40 to him, I will give it away for ₹ 35 for the next few days. Once he is my permanent customer, I also gradually increase the prices.”

A similar *jugaad* of negotiating the fare is also observed in the public transportation (especially three-wheeler autos) in India where the drivers decide their own fare for the journey, not abiding by the terms set by the government. In such a scenario, the passenger also gets a chance to negotiate the fare, because he/she also knows that the driver is asking above the limits set by the transport department of the state and they unanimously decide the fare after a short interaction less than 2 minutes. A *jugaad* is also observed at the time of payment of the fare after the journey. With a pretext of not having the appropriate change, the driver tries to extract the higher amount from the customer, hoping that the customer will leave the balance with him only. This is a most common *jugaad* observed in Indian transportation.

jugaad is also a common practice in the Indian temples, where a person does not require standing in the queue along with the other devotees. He just gives some money to the temple priest and enjoys the VIP treatment. The Temples have also started a *jugaad* trend, where they employ priests who stand at the entrance of the temple asking the devotees to just pay a minimal amount, and enjoy the special DARSHAN. This *jugaad* in interaction is another most important aspect of *jugaad* in the India.

Conclusion

Through this paper, we have covered the concept of *jugaad* from a bop point of view, just not as a quick fix, but with entirely a new frame, as an efficient and effective way of survival at the BOP. The paper discusses the concept of *jugaad* apart from its conventional definition of “making things do”. *jugaad* as discussed is engrossed to the grass root level of the BOP and has highly affected their way of living. Varying from a highly innovative *jugaad* in street markets and housing, to small scale *jugaads* in water and transportation, *jugaad* has influenced each and every person at the BOP in some way or the other. The paper has discussed all sorts of physical and social *jugaads* commonly observed at the BOP citing various examples as well as exploring the entire economics of the *jugaads* and thus concentrates of the entire system of these *jugaads*. The paper also likes to draw the issue of limited capital and resource constraints, which have forced the people to go for these *jugaads*, either legal or illegal. With a monthly income of few thousands, *jugaads* rather than a willing innovation, becomes a necessity to survive, which may even be dangerous in certain situations. The paper finally concludes that apart from an immediate and low cost solution, *jugaad* is emerging with an entire new concept as a “strategy of survival” at the BOP.

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