



Annual Report

Beacon AHEAD Institute

2021



Annual Report 2021

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Beacon AHEAD Institute

2021

1. Background:

Introduction: Beacon AHEAD Institute (BAI) is a non-profit, Registered Trust in India which works for the social development of India by creating innovative products that help people in need and bridge the gap between low cost, eco-friendly technology and community development.

Our Institute follows the whole cycle of creating awareness and products, training, maintaining and ensuring constant use and applicability of low-cost products in order to solve issues among underprivileged communities such as open defecation, illnesses due to contaminated water, smoke from cookstoves, low agricultural yield, etc. In turn, our approach revolves around providing low-cost toilets, safe drinking water treatment devices, smokeless cookstoves that produce Bio-char, etc.

We aim to create access to better livelihoods and improve the quality of life for low-income communities. We work in close collaboration with the Government of India and other social development agencies for providing better hygiene, sanitation and self-employed livelihoods through innovative products for the people of India.

Beacon Ahead Institute was established in 2012 for creating sustainable impact.

1.1 Our Focus areas:

The Institute works in five sectors namely Agriculture, Health, Education, Art and Design thus forming the acronym AHEAD. BAI focuses on innovations for rural development and tribal welfare for enhancing the economic

opportunities while working in close collaboration with Government, NGO's, research and resource institutions.

Beacon Ahead Institute (BAI) is very particular to align its work with the Sustainable Development Goals of United Nations and Global Compact initiatives:

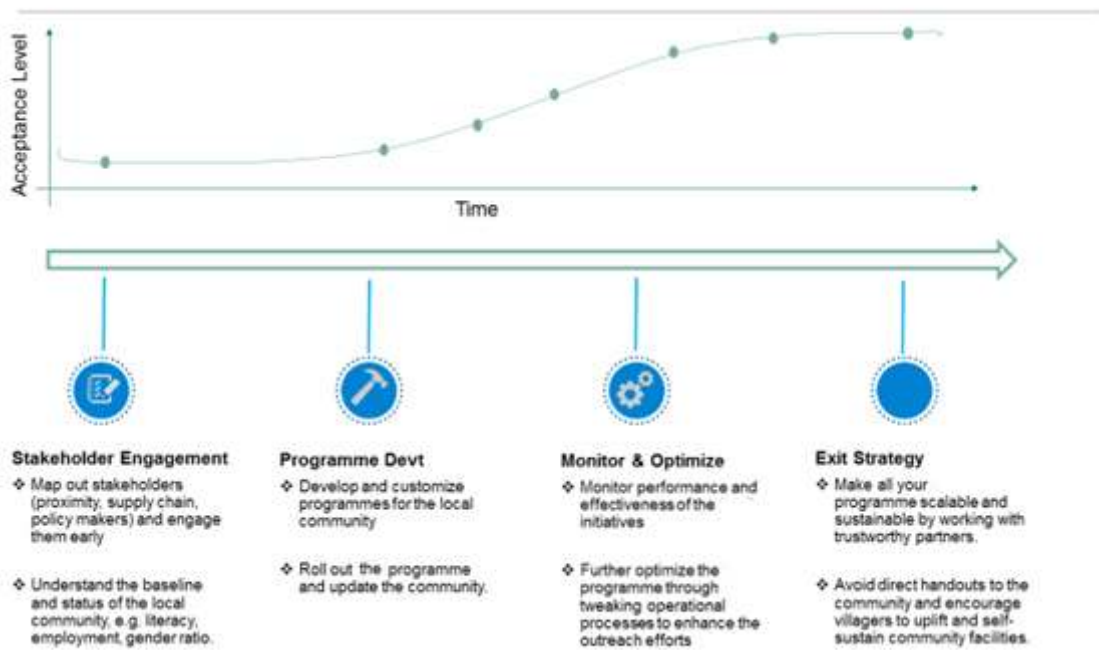


Alignment with Sustainable Development Goals:

"Meeting the needs of the present in tandem to enhanced abilities of future generations to meet their own needs"
BAI'S Focus areas are : 3,4,6 , 8 , 9 and 11

Human Development		Environmental Development
1) No Poverty		6) Clean water and Sanitation
2) Zero Hunger		7) Affordable and Clean energy
3) Good Health and Well Being		13) Climate Action
4) Quality Education		14) Life below water
5) Gender Equality		15) Life on Land
	Social Development	
	10) Reduced Inequalities	
Economic Development	11) Sustainable cities and communities	Good Governance
8) Decent work & Economic Growth		16) Peace, Justice and strong Institutions
9) Industry, Innovation and Infrastructure		17) Partnerships for the Goals
12) Responsible consumption and Production		

In line with the above framework BAI should focus its work on the above 5 focus areas to meet the communities needs and priorities and it is also particular about exit strategy as well.



We focus on making life better for people, by improving health, livelihoods and quality of life.



Our strength is in reaching out to people and working with them to develop products that they can make, use and create a sustainable impact.

We promote eco-friendly innovation and social entrepreneurship development programs.

1.2 How we make a difference:

- Development of innovative, eco-friendly, low-cost products.
- Creating access to better products and services that make a difference, to improve quality of life and health for people, communities and the environment.
- Creating improved opportunities for sustainable livelihoods.
- User Research, to find out what is needed, what works well and best ways to ensure user satisfaction throughout the development process.



1.3 Creating Sustainable Impact:

We feel happy when we work with poor Communities, and observe improvements in their health, prosperity, neighbourhood and environment,

etc., and create a long-term sustainable impact in the lives of the children, families and communities.

1.4 Promoting Improved Sanitation Treatment, in alignment with SDG 6 – Environmental Development

Beacon Ahead Institute (BAI) is a very strong proponent of on-site sewage treatment, especially treatment based on vermi-composting of human waste, which is aligned with SDG 6 - Clean Environment and sanitation for Environmental Development. This low-cost, low-maintenance technology converts sewage into a valuable fertilizer, with no smell or flies.

1.5 Developing Eco-friendly items for enhancing economic opportunities for women and youth entrepreneurs, in alignment with SDG 8 (Decent work and Economic growth) for Economic Development

We work to develop products that can be made from environmentally friendly materials such as banana fibre, coconut shells, bamboo, and recycled materials, etc. We help people learn how to make these products, so that they can earn a good income and become more self-sufficient.

For example, last year, we designed low-cost, eco-friendly products made from coconut shells. When coconut shells are smoothed and polished, they have a beautiful dark wood pattern, like teak wood. Useful, strong items can be made from this attractive and nearly free raw material. For example:

- i. Pen/pencil holders
- ii. Phone or tablet stands
- iii. Small storage boxes, etc.

We created a prototype of a low-cost, computer-controlled carving machine for automatically making nice-looking products from coconut shells. The photos below show the evolution of the design, from 2020 to this year.

We also worked on creating a booklet to teach blind people about Braille, the international reading and writing system for people who are not able to read printed text. This booklet would be helpful for families who have a young blind family member, as well as older family members who are losing their eyesight. We are working in parallel to develop a low-cost printer, to make these books locally, affordably and appropriately in the local

language(s). These printers don't need any electricity, and they can print the Braille booklets using recycled paper, which is environmentally friendly, too.

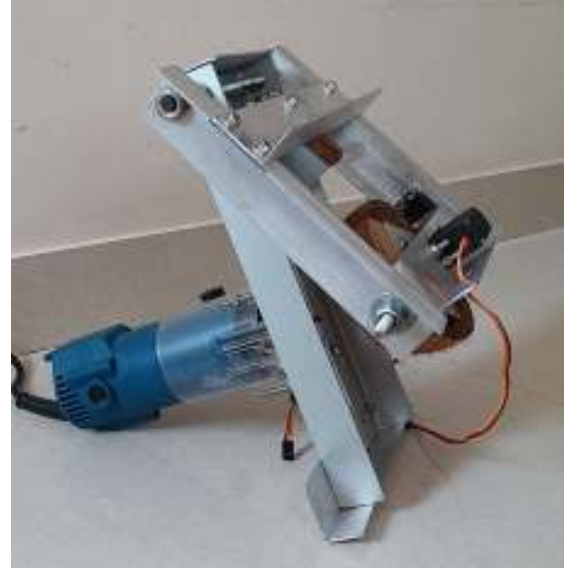
Coconut Carving Machine

1st Design, 2020



Coconut Carving Machine

2nd Design, 2021



The vermi-composting sewage treatment, mentioned above in Section 1.4, is also very environmentally friendly, as it diverts human waste away from the practice of being dumped into rivers and onto fields.

OUR PROJECTS

2. Construction of Eco and environmentally friendly and affordable Toilets in Bihar

2.1 Overview:

At Beacon AHEAD Institute, we are promoting an innovative new technology for on-site treatment of waste. We produced two documentaries to show how eco-friendly toilets and sewage treatment plants are being powered by Nature's own super stars: Earthworms!

Earthworms in a worm bed above a filter media bed combine to create a very powerful and versatile filter for human waste and sewage. Toilets can be flushed into a small worm filter (or 'vermi-filter'). Sewage can be treated in a sewage treatment plant with numerous vermi-filters as the main processing units. The benefits are:

- Environmentally-friendly treatment of human waste and sewage.
- Little to no smell. The main odour is an earthy soil smell.
- Valuable by-products:
 - Vermi-compost, for adding nutrients to soil, and
 - Water for irrigation, when the outflow of the vermi-filters is cleaned and disinfected.
- Little to no external power is required.

The two documentaries, below, show the different ways that the worm-powered sewage treatment that was developed by PriMove, PATH and Bear Valley Ventures, can be used, and how it really benefited people in low-income villages and slums in many areas around Pune and Kolhapur, Maharashtra:

YouTube video #1: <https://www.youtube.com/watch?v=rVol3lv9FgM>

YouTube video #2: <https://www.youtube.com/watch?v=X7d9T7fq1ws>

2.2 Purpose

There is an urgent need in India for environmentally friendly Sewage Treatment.

Health and Hygiene are greatly improved when toilets, hand-washing and safe drinking water are available at home, and when sewage is treated so that pathogens are not spread in communities.

Need:

Without a toilet at home, women and girls go for open defecation, where they are particularly vulnerable. Generally, they can relieve themselves only once, before daybreak. For the rest of the day and night, they simply hold back their toilet needs. As a result, they choose to drink very little water, and tend to get digestive and urinary health problems. In hot weather, they can easily become dehydrated.

The Swachh Bharat Abhiyan, or Clean India Mission (2014 - 2019 for Phase 1), built millions of toilets in India. However, there is no affordable way to gather and treat the human waste that accumulates in the leach pits and septic tanks of

toilets in areas with no sewerage systems. As a result, men tend to go for open defecation and not use toilets at home, as the cost to empty leach pits and septic tanks is significant.

On-site treatment of human waste can solve this problem, if the treatment is low-cost. Then everyone in the family can feel comfortable using the toilet as often as they like.

Earthworm bio-filters are an excellent, eco-friendly, fast and affordable way to treat human waste. The technology has been developed over the last decade, and simple, robust bio-filters can now be placed in toilets to provide effective, low-maintenance and low-cost sewage treatment.

Between June to November, 2021, we built four "**Beacon Earthworm Sewage Treatment**" Toilets (we use the acronym "**BEST** Toilets") in North Bihar, to create a model and replicate the same, with support from the Government and other agencies in the near future:

1. We trained local people how to make or procure the components of the toilets, and then assemble the toilets in or beside people's homes.
2. We built four BEST toilets as part of this pilot project in Muzaffarpur district, Bihar. These user-friendly toilets are serving as models for other community members to see.

There is great need for toilets in North Bihar. In some ways, North Bihar has not been a priority area in India, and many families there are not living at the same standard of living as in rest of the country. One toilet can have a huge impact on a family.



For this project, an on-site needs assessment was initiated in Muzaffarpur district, Bihar, to determine the most deserving families in need of new toilets. We installed one toilet for girls in a local primary school. It is a privilege to be of help to these deserving communities, especially in flood prone areas as is the case in Muzaffarpur district.

And in the future, once there is acceptance and understanding of the BEST Toilets, replication of these toilets can proceed easily. BEST Toilets can be built more efficiently, as the moulds, training, etc. will be completed during this training and construction pilot project.

2.3 Outcome/Benefits

The toilets are durable, using Reinforced Cement Concrete (**RCC**) parts (wall and floor panels, and shelves). We install strong doors, hinges and locks that are suited to local preferences.

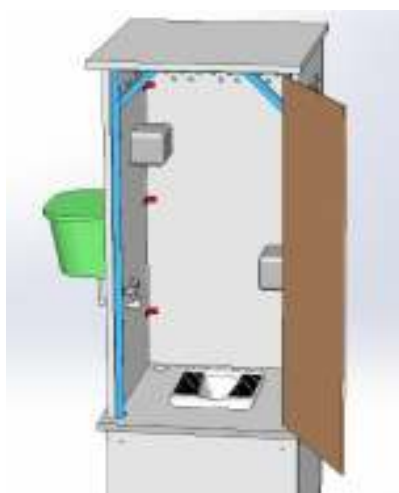
The benefits of building with RCC modular parts are that the BEST Toilets are:

- Safe and Private
 - Impact resistant
 - Long lasting and weather resistant
 - Modular Construction, with different features and options
 - Better finish, with no sharp corners
 - Water resistant
 - Fire resistant
 - Termite resistant
 - Made from ISI materials
 - Easier and faster to build, with a consistent, high-quality level
 - Cost effective and excellent value
-
- Entire toilet is Eco-friendly, provides on-site treatment of waste in an aerobic systematic approach

These RCC panel toilets can be built either inside people's homes or outdoors, near the home. People feel confident that concrete is pacca ("strong and long-lasting"), so they will trust that the toilet will survive normal abuse, such as a buffalo scratching her back on the corner of the toilet!

We install solar or mains electric lights in the toilets, so that people feel comfortable using the toilets at night. It's important to be able to see well at night, so one can check for any hazards such as snakes and/or other pests inside before one enters the toilet.

Grab bars (or "handles") are installed on either side of the squat pan, to help people to balance themselves, and to stand up after using the toilet. Two concrete 'Cubby Shelves' are installed on the walls of each toilet. One shelf is outside, near the water tank, for storing soap, etc. The other shelf is higher up on an inside wall, near the back wall. Phones can be placed on top of this shelf. The inner space inside this rear shelf faces the back wall, so there is a lot of privacy for women and girls to keep menstrual products inside the shelf in the toilet.



A water tank, shown above in green on the outside wall of the toilet, provides water inside the toilet for washing and cleaning. The water tanks are small plastic "Sintex" tanks, that are supported on a reinforced concrete shelf.

A floor drain at the rear of the pan drains away water and soap used for cleaning and sanitizing the toilet interior. It is good to divert this water into a separate drain, away from the bio-filter, so that the earthworms don't get too much soap or cleaning chemicals flushed through their bed.

2.4 Proposed Timeline

To ensure high quality toilets and timely construction, we originally scheduled to accomplish the following three Phases of work by August of 2021. Due to bad weather, the actual finish date of Phase 2 was delayed by one month, and all four toilets were handed over to the users in September, 2021.

Project Schedule:

Phase 1: July, 2021

- Locate a work site, and choose recipient households and one school.
- Site visit to inspect molds, other tools and fixtures, for creating consistent, high-quality parts and components of the toilets.
- Start making the BEST Toilet parts and components, and store at or near the work site.
- Test fit all parts and components, to identify any quality issues.
- Note and incorporate any design changes required, if any.
- Share photos and written updates of progress.



Phase 2: July and August, 2021

- Build and install at least 4 toilets in Muzaffarpur district, Bihar.
- Write updates and gather photos: Deliver progress report(s).

Phase 3: Late August, 2021

- Obtain feedback from the households, school and mason/fabricators about the installation and use of the toilets.
- Gather feedback from crucial stakeholders and community leaders about the toilets.

- Final report to be compiled from written updates and submitted photos, and feedback gathered in this phase of the project from the users.
- Discuss building more toilets, if desired. Scope to take this forward.

2.5 Summary of Actual Project Progress:

1. A total of 4 BEST Toilets were built and installed in 3 households and one school in Muzaffarpur district, Bihar by the end of September, 2021.
2. The girls' toilet in the school was built to give girls access to safe sanitation.
3. All molds, tools, drawings and training were provided to the fabricators, so that they can manufacture BEST Toilets in Muzaffarpur district, for this project and in the future.
4. Full documentation of this project was provided, in the form of photos and a report.
5. Due to delays caused by heavy rain, the toilets were actually completed in September, 2021. The extra time allowed us to make some improvements to the design, and complete the toilets with strong raft foundations for the soft clay soil in Muzaffarpur District so as to provide a solid base on which the toilet structure would stand durably.



2.6 Product Improvement Process:

We took notes and gathered feedback from the technical team of engineers and the manufacturing team. We are incorporating this feedback into our plans for future toilets, and will use their feedback to improve the pre-casting of parts and the assembly of the BEST toilets.



2.7 Construction:

Four BEST toilets were built in Muzaffarpur District, Bihar:

The four completed BEST toilets:



Finished Toilet at HH1



Finished Toilet at HH2



Finished Toilet at HH3



Finished Toilet at the Primary School

All completed toilets include an electric light, as shown (above left) in the toilet constructed for Household 3.

2.8 User research:

This section documents the feedback from users and manufacturers of the BEST toilets.

2.8.1. Feedback before receiving and Using BEST Toilet:

Water Supply at Households:

All people have Nal Jal water connection as well as a handpump. They wash their hands near the handpump. HH2 uses handwash liquid while others use soap.

Problems before having a toilet:

Users stated that is very difficult to go for open defecation in rainy season as there is muddy clay all around and people tend to slip and fall frequently.

There is danger of snakes, scorpions and other insects as the households are surrounded by jungle area. People remarked that they find it scary to go for open defecation.

For the family from Household 1, it is difficult to go for open defecation in daytime as there are agricultural fields around the home and people are around during the day working in the fields. And beyond area is the jungle. It is also challenging to go out for toilet purposes especially when they suffer from ill health such as diarrhea. Family faces lots of issues even at night time as snakes and scorpions move around a lot at nights.



Reasons for not having a toilet:

Monetary issues were the huge reason for not having a toilet at home for all the three households.

Diseases before having a toilet in home and community:

People suffered from: Cold, cough, fever, headaches, diarrhea, heart problems and paralysis, age related illnesses, stress, overworking issues and seasonal changes.

People were of the opinion that eating clean food and maintaining cleanliness would improve health.

Motivating factors for people to get a toilet built in their homes:

- To stop open defecation and have more hygienic and clean practices.
- Avoid dangers of the jungle.
- Provide a toilet to ensure safety and privacy for the protection of the women and daughters of the households.
- Improve the health of the household

2.8.2 Impact after using BEST Toilet:

BEST Toilet recipients stated the following, when asked about their experience with their new toilet:

- Having a toilet is beneficial for children. People remarked that having a toilet ensured safety, privacy and well-being for the women and daughters of the households.
- It is highly convenient to have the toilet at homes as one can access it at all times.
- It has several user-friendly features that are very useful and make the toilet appealing.
- People found that the vermi-compost is an added advantage that the toilet provides and the compost would be useful for them in their agricultural farms.
- Community considers this toilet as being useful and it helps improve social status. The families received a lot of praise from the community and consider it as a huge asset.
- The toilet was built in less cost as well as using less space. As a result, other people in the neighborhood are also very interested in having such a toilet built in their homes. In a way, an awareness about the importance of having a toilet has also increased.

2.8.3 Usability table:

The following table lists users' feedback about how usable their toilets are:

Usability parameters	User's feedback
Easy to use rating	Very easy and convenient to use by all households
Pacca/kuchcha	Toilet is a Pacca structure. It is better than a brick toilet as it is stronger and is held up on slab, gravel and sand.
Durability range	20 years to 50 years. It depends on usage.
Privacy	Women and girls feel safe using the toilet
Safe to use at night	It is safe to use at night as light is present inside the toilet

Usable in all seasons	<p>The toilet is installed higher up from the ground level so it will not flood inside the toilet. It is much better than going for open defecation as the toilet is located at home.</p> <p>HH3 stated that since the area is prone to flooding, the toilet also may flood in rainy season and become difficult to use for a while till the rain water recedes.</p>
All family members will use	<p>All users said that the whole family would use the toilet. However, in HH2 the Father in Law will find it difficult to use the toilet as he is a paralytic patient.</p>
Easy to clean	<p>Ash is used to clean utensils so similarly the toilet will be washed using ash very easily.</p>
Toilet promotes safety and privacy	<p>Users stated unanimously that the toilet does provide safety and privacy.</p>

2.8.4 Affordability:

BEST Toilet recipients stated the following, when asked about their perceptions about toilet construction prices and the affordability of their new BEST toilet:

- Cost for this toilet construction would be anywhere between Rs.12,000/- to Rs. 50,000 depending on people's needs.
- Septic tank toilets cost Rs. 1 lakh whereas cement ring toilets costs Rs. 30,000 to Rs. 35,000.
- Households expressed their gratitude, stating that they are grateful they got a toilet for Rs. 4000. (NOTE: Each household contributed Rs. 4000 for labour costs to build their toilet. Even though the toilets were fully funded for, the households were told to provide Rs. 2000 to 4000/- directly to the labour for digging their soil upon which the toilet would be installed and the rest of the amount for other labour charges. The amount given by the households creates a sense of ownership and contribution, which makes it more likely that the household will respect, appreciate and use their toilet. Based on several surveys, it was found that most toilets provided free of cost fell out of use as families did not value it and used the toilet room structure for storing purposes. It was only to prevent toilets from going out of use that the amount of Rs. 2000-4000 was collected from the households directly by the labour who provided the work in return for the amount paid).

- Hence to prevent discontinue of use and to motivate families to have better sanitation practices for overall well-being, BAI decided to execute this project in this manner.

Decision making authority:

In most households, both the husband and wife took the decision to have the toilet built in their home as they all have school-going kids and open defecation is a problem for them. In HH1, lady of the house took the decision for the welfare of her grandchildren.

2.8.5 Promotions and Marketing:

Households said they will advocate the use of this toilet as it is:

- ✓ Space saving
- ✓ Portable and can be reassembled and/or shifted
- ✓ Includes tiles
- ✓ Provides vermi-compost that is useful for irrigation
- ✓ Overall it is a good toilet



2.8.6 Feedback on overall toilet and its features:

This table summarizes the feedback about the toilets from the households and from the school:

Best toilet (Overall structure)	<ul style="list-style-type: none"> ✓ This toilet is better than fully plastered latrines as it is airier. ✓ In a small space, the toilet was set very well. ✓ Insects will not bite inside the toilet. ✓ Care needs to be taken to keep the worms alive as only then this toilet will function effectively.
Space	It is sufficient
Height	Users remarked that “Bihari people are short so it is fine”.
Roof	Roof should be wider so that rain water will not fall on the walls but would fall outward. The roof should be 6 inches wider on all four sides.
Door and hinges	Door is much better when compared to the ones that most people use in toilets.
Cubby shelves	Very apt and useful to place a bar of soap. It is a good feature for women as they can use it and also store menstrual cloths as per their need.
Taps	Tap inside the toilet is useful. No need for tap outside the toilet as hand washing is done by the handpump.
Height of foundation slab	It is a new design. The sub-structure will not fill up soon. It is similar to a leach pit system as it is 4 - 4 and a half feet deep.
Vents	Prevents rain from entering into the toilet especially during stormy weather and keeps the toilet airy.

Handles	Handles are good for old people and for those who are ill. It enables people to easily sit and stand up using the handles.		
Light	Bulb inside the toilet is useful.		
Water tank	Sufficient as 40 litres of water is enough for one whole day. If need be HH1 will get a bigger Sintex tank.		
Top three features as stated by each of the 3 households:	HH1	HH2	HH3
	1. Walls, as these are strong. 2. Tiles 3. Water tank and tap	1. Height 2. Space 3. Stair	1. Overall toilet structure and sub-structure
Others	The steel drain cover was clogged in HH2 and so the mason unclogged it.		

2.9 Conclusion:

The BEST Toilets were well received by the household members and the school personnel. There was significant interest from the Mukhiya and the community for more toilets to be built in their Panchayat.



Household 1 Elders, with some of the members of our team

We are excited to improve the toilet design, based on the feedback we received, and to build many more toilets in the years to come.

Our gratitude and appreciation to all the people and our team who helped to make this work possible. We cannot thank you enough.

3. ICDS Anganwadi Centres and BEST Toilets

3.1 Overview:

Beginning in November, 2021, Beacon AHEAD team started a project to renovate three ICDS Anganwadi Centres and to build ten more BEST worm composting toilets. This project is located in Muzaffarpur and Vaishali districts, Bihar. We aim to complete this work by April 2022.

The photos below show a typical BEST Toilet, and an example of how ICDS Anganwadi Centers look after renovation:

BEST Toilet



Renovated ICDS Anganwadi Centre



3.2 Purpose:

A. Building 10 More Best Toilets:

Four BEST Toilets were built in Muzzafarpur District in September, 2021. These toilets were very well received, and many more people came forward requesting one for their own families.

Hence based on the need among people and the support of our individual donors, we have initiated this project to build 10 more BEST toilets for those who are in dire need and cannot afford to have a toilet built at their homes.

As a result, households will be screened and the toilets will be built in 10 households between November 2021 to April 2022.

B. Renovating Integrated Child Development Scheme (ICDS ANGANWADI) Centers:

There is a need to renovate and create model ICDS Anganwadi Centers amongst 3 centers in Vaishali District of North Bihar.

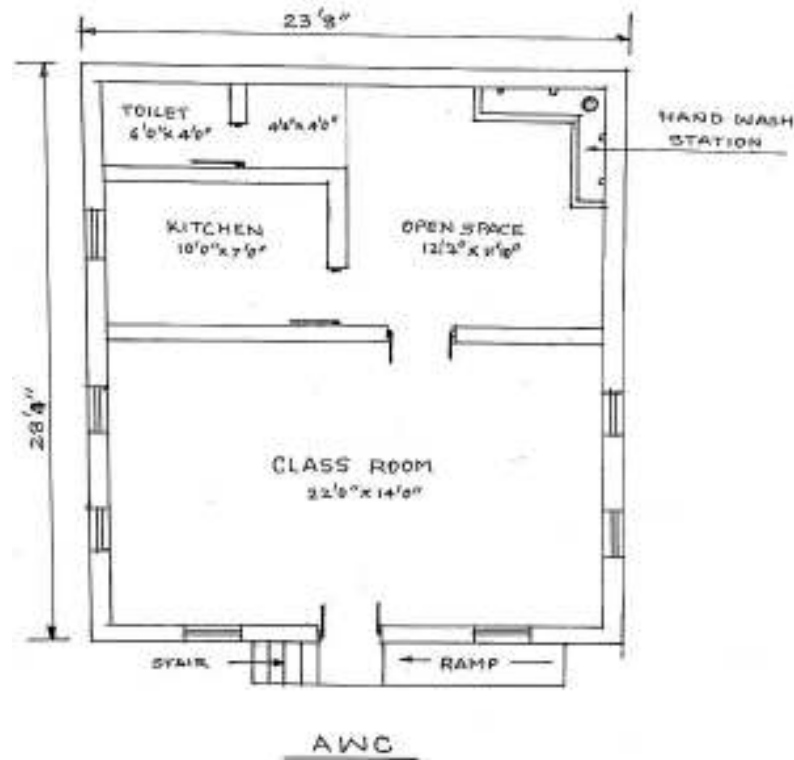


Inside ICDS Anganwadi Center Needing Repair

Need:

ICDS ANGANWADI Centers are part of the Government of India program through which pre-school education, nutritional meals, primary healthcare, immunization, health check-up and referral services are provided to children under 6 years of age and their mothers.

Under this program, the Government of every state has built various ICDS ANGANWADI centers to provide these services to the mothers and children at each ward.



Typical Layout of an Anganwadi Center

However, these Centers were either built many years ago or have been built using low quality materials due to which many to most of these Centers are under the threat of collapse or are becoming close to being unused. The major issues are as follows at the ICDS ANGANWADI Centers:

- Seepage and cracks in the roof and walls
- Lack of appeal due to old, damaged looking structure
- Many Centers have damaged windows and doors
- Absence of proper TLM kits and storage options
- Lack of seating arrangement for the children
- Dysfunctional toilet due to lack of water supply and unhygienic past usage
- Lack of handwashing system
- No means of cooking on cookstoves that work
- Dearth of kitchen garden
- Lack of drinking water supply
- Absence of light within the classroom, etc.

Due to the above-mentioned issues, children are facing challenges and are unable to have access to adequate learning and hygienic healthcare.

Government also lacks sufficient funds to renovate these Centers and thereby children and mothers in communities are facing innumerable problems.

3.3 Outcome / Benefits - Renovating ICDS ANGANWADI Centers:

As there is immense need to support the Government in their efforts to provide pre-primary education and quality healthcare to children below 6 years of age and to their mothers. Beacon AHEAD Institute aims to bring about the following developments at the ICDS ANGANWADI Centers, without causing any structural changes to the Centers:

- Renovations of the roof and walls to prevent seepage and make these waterproof
- Painting the entire Center for better appeal and adding colorful images and/or matter that encourage and motivate children to learn as per the BALA model criteria (**B**uilding **A**s **L**earning **A**id) so as to holistically incorporate activity based learning, child friendliness and inclusive education by using the school infrastructure).
- Repair all the windows and doors
- Provide proper TLM kits and storage box made out of recycled plastic panels for the TLM kits
- Organize satisfactory and useful seating arrangement for children
- Completely renovate the toilet and add tiles along with provision of water supply
- Build a handwashing station
- Build smokeless cookstoves that work without electricity
- Create a vertical vegetable garden on the walls near the kitchen
- Provide a water filter that works on gravity, as there is lack of proper electricity in these Centers.
- Include solar light inside the classroom and toilet

These developments would enable the ICDS ANGANWADI Centers to become models for change and help children and mothers in those respective communities to have higher and better quality education and health which in turn would result in creating awareness and leadership in reinventing existing programs to achieve their goal and prevent issues such as illiteracy, malnutrition, widespread diseases and pre-mature deaths among children and mothers.



AWC - Before Renovation



AWC - After Renovation

In addition, many new features in these ICDS ANGANWADI Centers will be environmentally friendly products that will add to the spin off benefits of executing this project.

3.4 Timeline

To ensure best quality toilets construction and timely Anganwadi Centre renovations by April 2022, we will accomplish the following in close collaboration with the Government of Bihar:

Phase 1: November-December, 2021

- Locate a work site, and choose recipient households and one ICDS ANGANWADI Center.
- Site visit to inspect moulds, other tools and fixtures, for creating consistent, high-quality parts and components of the toilets.
- Build 3 Best toilets
- Fully renovate and complete 1st Model ICDS ANGANWADI Center in Patepur, Vaishali District.
- Note and incorporate any design changes required, if any.
- Share photos and written updates of progress.

Phase 2: January-February, 2022

- Build and install 3 toilets.
- Fully renovate and complete 2nd Model ICDS ANGANWADI Center
- Write updates and gather photos: Deliver progress report(s).

Phase 3: March-April, 2022

- Build and install 4 toilets
- Fully renovate and complete 3rd Model ICDS ANGANWADI Center

- Gather feedback from crucial stakeholders and community leaders about the ICDS ANGANWADI Centers and the toilets.
- Final report to be compiled from written updates as well as submitted photos, and feedback gathered in this phase of the project from the users and Lady Sevikas at all 3 model ICDS ANGANWADI Centers.

3.5 Summary:

1. A total of 10 BEST Toilets will be built and installed in households in Muzaffarpur district, Bihar by the end of April, 2022.
2. Three model ICDS ANGANWADI Centers will be renovated in Vaishali district, Bihar.
3. Pre-casting the toilet RCC parts and collection of Anganwadi Centre learning materials was started in November, 2021.
4. Full documentation of this project will be provided, in the form of photos, reports and videos.

3.6 Conclusion:

Beacon AHEAD will focus on:

1. Providing Universal Access to quality health service and joyful learning.
2. Giving children best possible chance to survive and thrive.
3. Investing in health and well-being for children as a basic foundation for better communities.

All the above are in alignment with Sustainable Development Goals under Human Development of SDG 3 (Good Health and wellbeing).

4. Coconut Carving Machine

4.1 Overview:

Coconut shells are available for low cost, or even no cost. These shells can be carved by an automatic machine at home into products that can be sold for Rs. 100 or 200, or even more.

Each product takes a few minutes of effort: to load the machine and to check and polish the final product. In this way, a woman or man spending time at home can carve several coconut shells while doing other work at home, while the machine automatically carves the shells into beautiful products. This can significantly increase the household income, without much extra effort or expense.

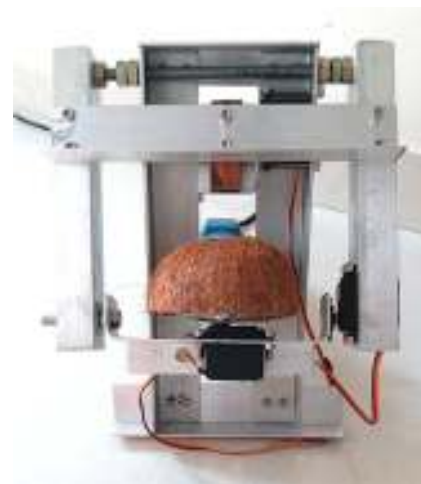
The machine was designed with minimal mechanical moving parts. Many CNC machines use threaded rods to create linear motion from the motors. All of the motion in this machine is caused by simple rotation and the use of one cam. This allows the machine to be very affordable, as well as simple to build and maintain.

In 2019 and 2020, we developed a preliminary prototype (see above) for carving coconut shells, using stepper motors for turning the coconut shell, and a trimmer router for cutting the coconut shell. The results are beautiful, as the natural colour and texture of the shells are hard and rich brown, similar to teak wood!

At Beacon AHEAD Institute, we learned a lot about how to improve this prototype machine, and in 2021, we set out to redesign this computer-controlled carving machine to be even better.

We wanted the machines to be:

- Easier to use
- Even more affordable
- Able to continue carving a coconut shell after a power outage
- Lighter weight. The first prototype was heavy, and the motors had difficulty turning to

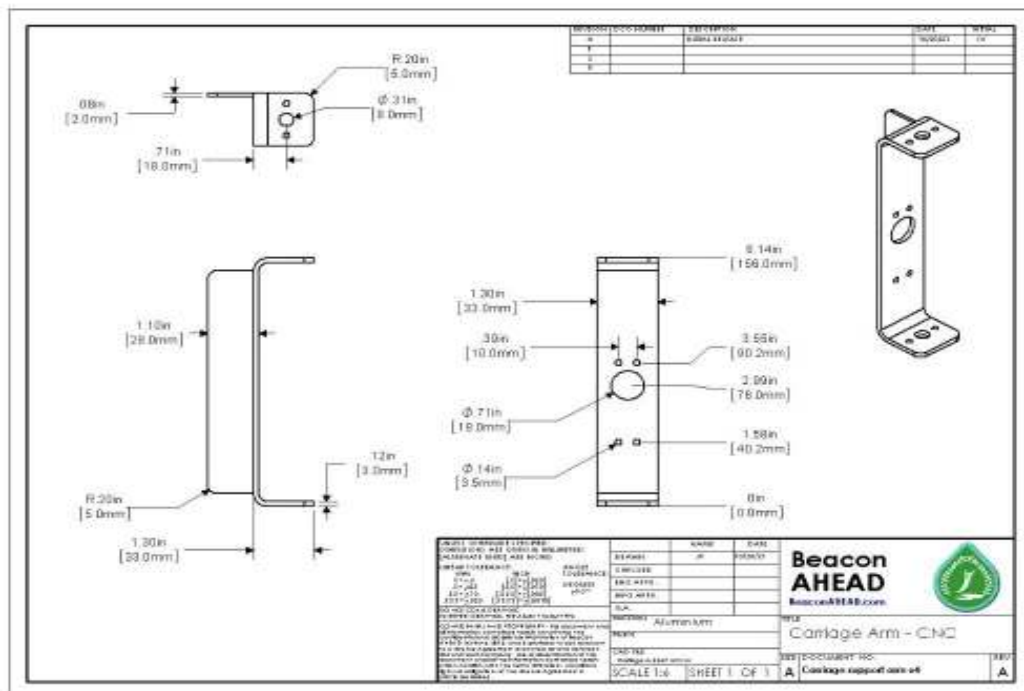


lift the heavy plywood carriage. The coconut shell by itself is very lightweight.

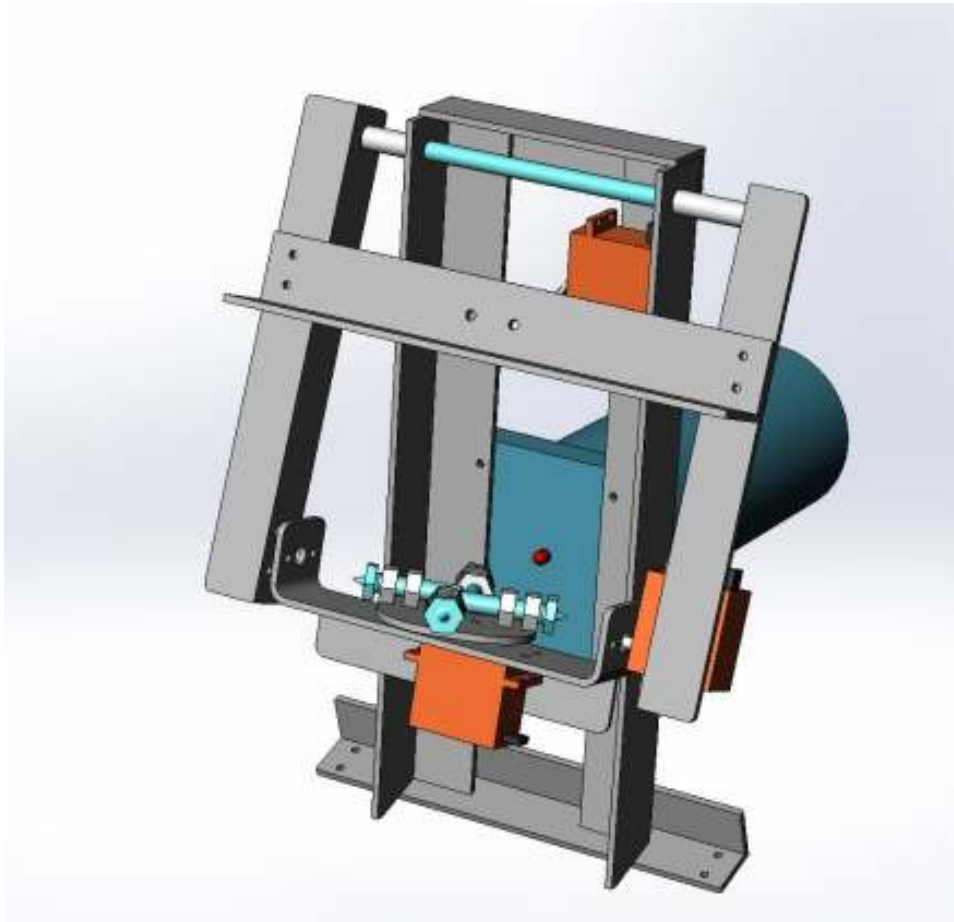
4.2 Details:

- i. Developed an improved coconut carving machine:
- ii. Created CAD (“Computer-Aided Design”) models, parts, assemblies and drawings of several new machine designs.
- iii. Switched from three stepper motors to three servos to control the motion of the coconut shell and carving. Servos (shown in orange colour in the image above) have an absolute position setting, so that carving can resume after a power outage. Stepper motors simply take one step forward or backwards, and rely on counting steps to know where they are. When the power goes out, the stepper motors’ positions are unknown.
- iv. Met with fabricators and CNC machine shops to discuss the best new design, and how to make the components easier to make.

Sample Drawing from the CAD Model The Carriage Arm:



Computer Model of the Improved Design:



4.3 Cost Estimates for potential projects related to coconut carving machines:

- i. Cost estimate for developing coconut carving machines for replication: Rs. 4 to 5 Lakhs for product refinement and user-satisfaction testing, in partnership with community-based organizations in Bangalore and Hyderabad.

4.4 Benefits for the community:

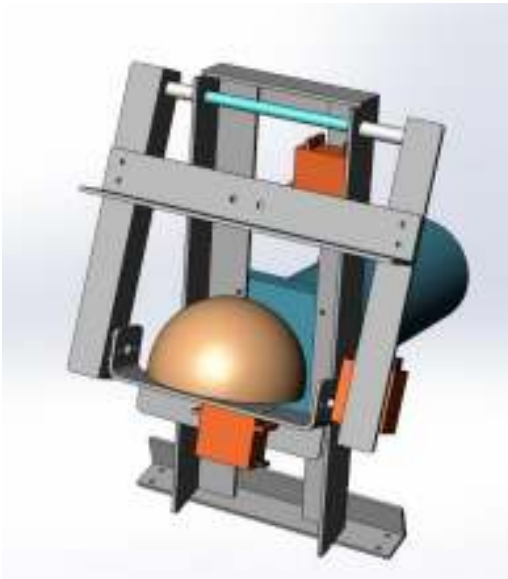
- i. Income generation for household members in the range of Rs. 500 to 1000 per day, by making beautiful carved coconut shell products.
- ii. Income generation for manufacturers and maintenance workers in the range of Rs. 1 to 2 lakh per year, making and servicing these computerized carving machines in India.

4.5 Carving Machine Design Progress, in 2021

1. Refined the design of the low-cost, computer-operated machine to carve the coconut shells:

Improved Design

Computer Model:



Coconut Carving Machine

Side View:



The improved design uses aluminum bars instead of heavy plywood parts. In addition, the coconut shell is lifted up and down, and the heavier router remains stationary.

2. Improved the cam mechanism for moving the cutter away from the coconut. The first prototype lifted the trimmer router away from the coconut. We looked at design changes so that the lifting cam had a better mechanical advantage. But then it made much more sense to lift the lightweight coconut shell away from the router, instead of vice versa. The new design incorporates the router as part of the base and body of the machine, so the overall machine is much lighter weight and more compact.
3. Purchased servos, aluminum L-angle bars, power supplies, Arduino micro-computers, etc., for making a second prototype of the coconut carving machine:

Aluminium L-angle Bars



Servo (left) vs Stepper Motors



4. Built the second-generation coconut carving machine, incorporating all of the desired improvements. The new design includes lower cost, more powerful motors, a smaller and lighter weight frame, and water-proof materials such as the aluminum frame:

New Prototype – Front View



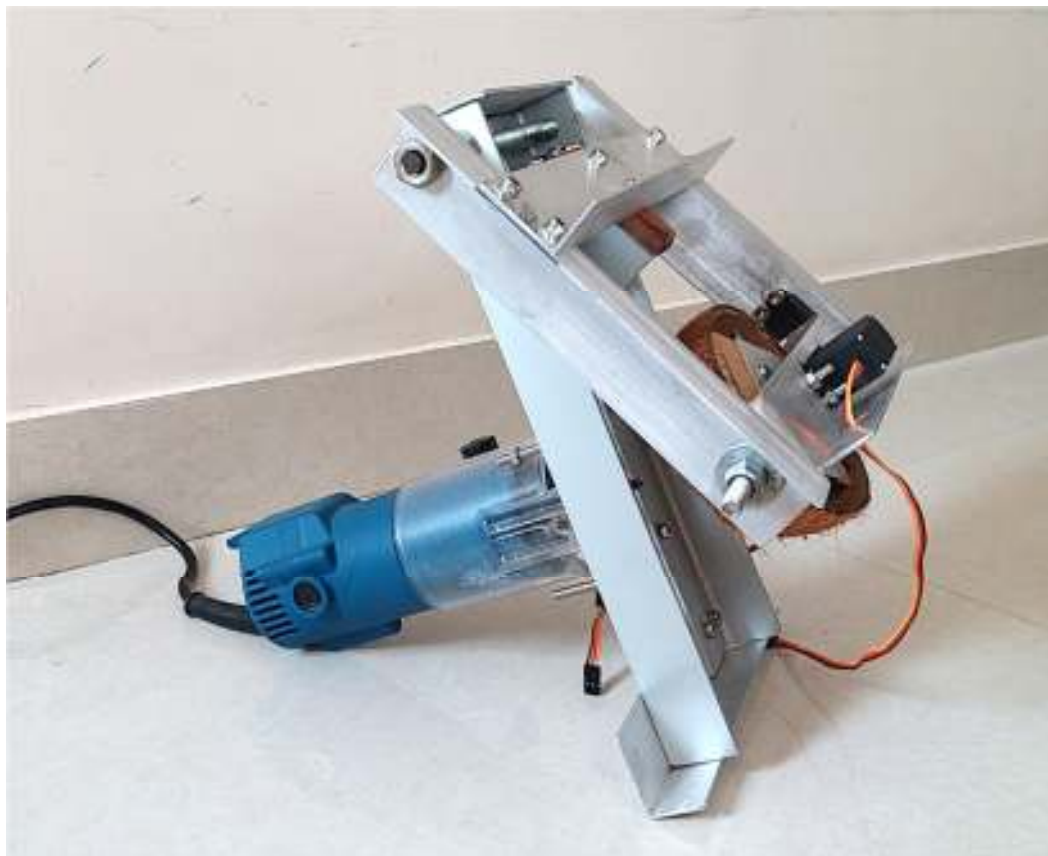
The fabrication is based on simple parts that can be made using a hand drill and a cut off saw or grinder. The motors are attached with holes in the aluminum bars, nuts and bolts.

The assembly is modular and simple to assemble. Any parts or components that break can be replaced easily.

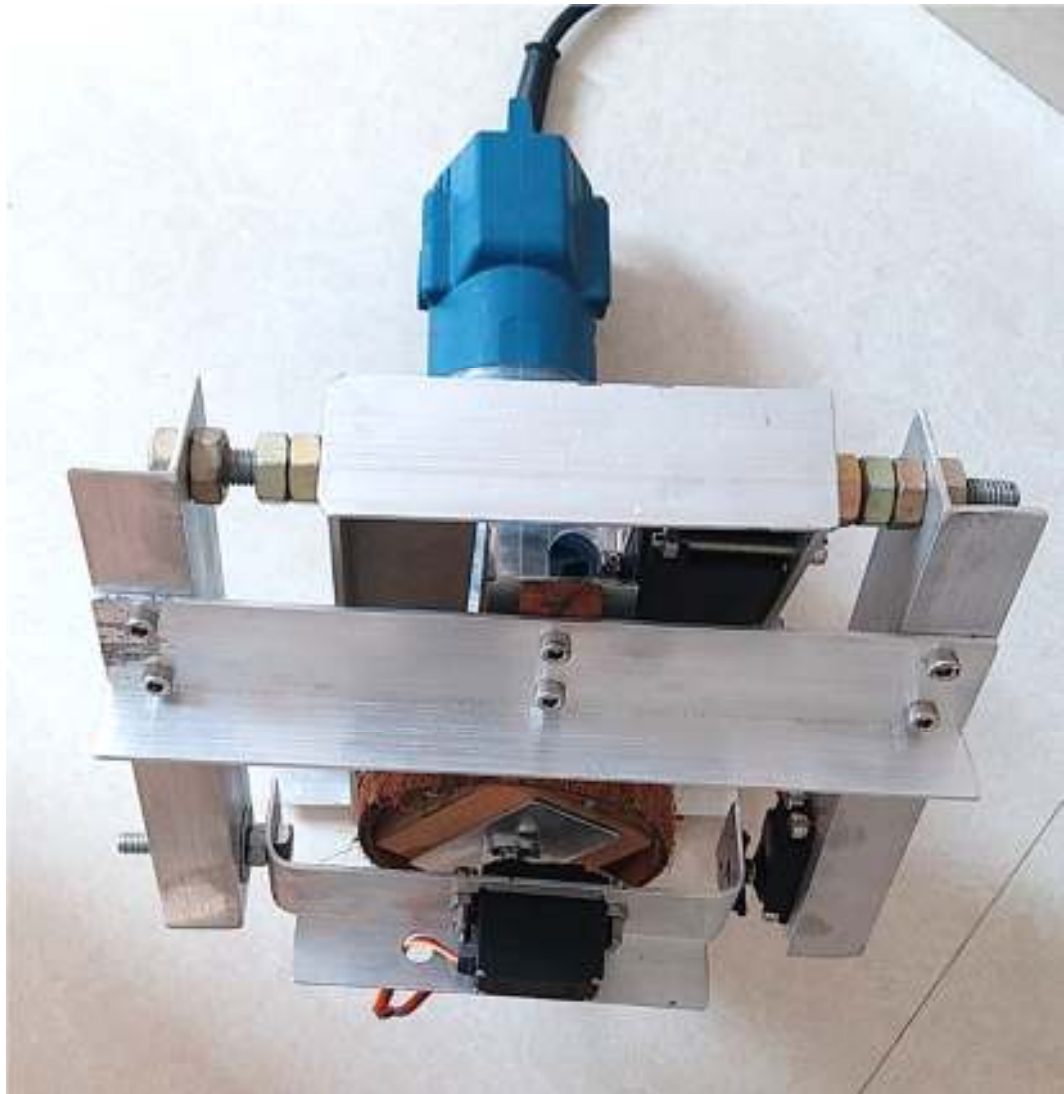
The three servos (motors) receive “Pulse Width Modulation” (PWM) signals on their inputs. Depending on the width of these alternating input pulses, the motor will turn to a corresponding position. Thus, any time the program is restarted, the coconut will be able to turn to the correct position, no matter where the previous cutting was interrupted, for example: due to a power cut.

The PWM signals can be provided by simple computer cards, such as Arduino UNO or Raspberry Pi Pico. These tiny computers cost less than Rs. 300, so they are very affordable.

New Prototype – Side View:

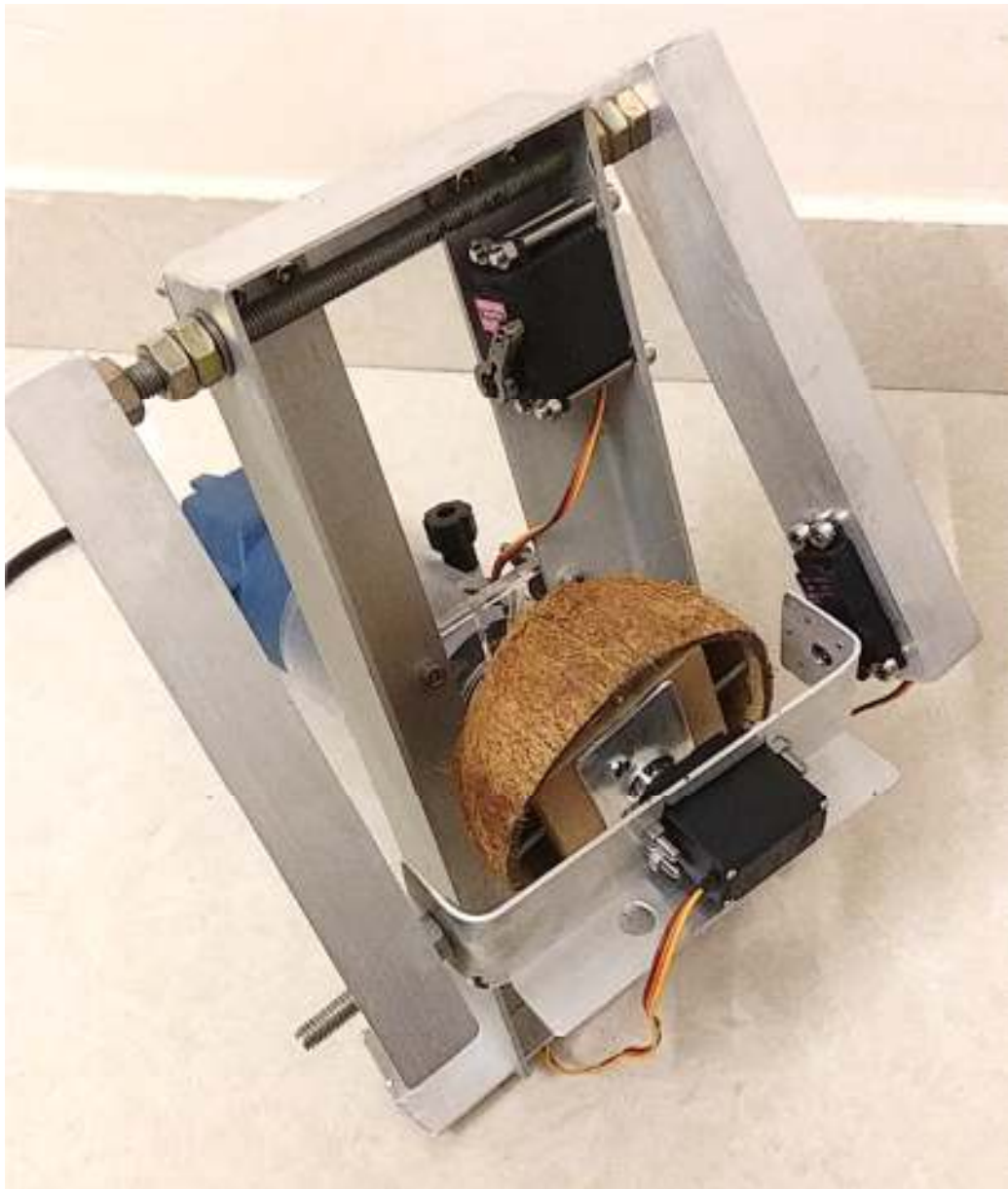


New Prototype – Top View



In 2020, we used a laptop to tell the Arduino UNO how far to turn each motor and when. However, since the servos are so much simpler to control than stepper motors, we have designed the system to work without a laptop computer. The positions and speeds of the servos are controlled completely by the Arduino! This is a huge simplification in the machine (not needing a laptop), and in the operation of the machine (not needing to know how to use a laptop.) The machine can begin carving the coconut with simply turning on the power supply and pressing the “START” button.

Lift Bar removed from the front, showing the third Servo and Cam Arm that lifts the Coconut Shell:



The small computers have the ability to turn the coconut and lift the coconut up and down, for stopping and starting the cutting and carving. The small computers have enough memory (RAM) to store all the positions of the three motors, so that an entire coconut design can be carved independently.

These machines will be enclosed in a simple box. This will keep the noise and dust of the running machine inside, and it will keep curious children, etc., outside where it is safer.

4.6 Cost estimate for improving the machines and products:

- i. Tie up with entrepreneurs and manufacturers to build these machines, to further increase jobs and livelihoods.
- ii. Link up with Micro-finance groups to help low-income people and/or entrepreneurs to purchase the carving machines from local manufacturers for Rs. 6000 or less.
- iii. This would include training, support, and machine maintenance.
- iv. We also would like to make the machine and programming it, an open-source project, so that others can design better machines and interesting new products that can be made with these machines. In this way, the project can grow organically.

4.7 Impact:

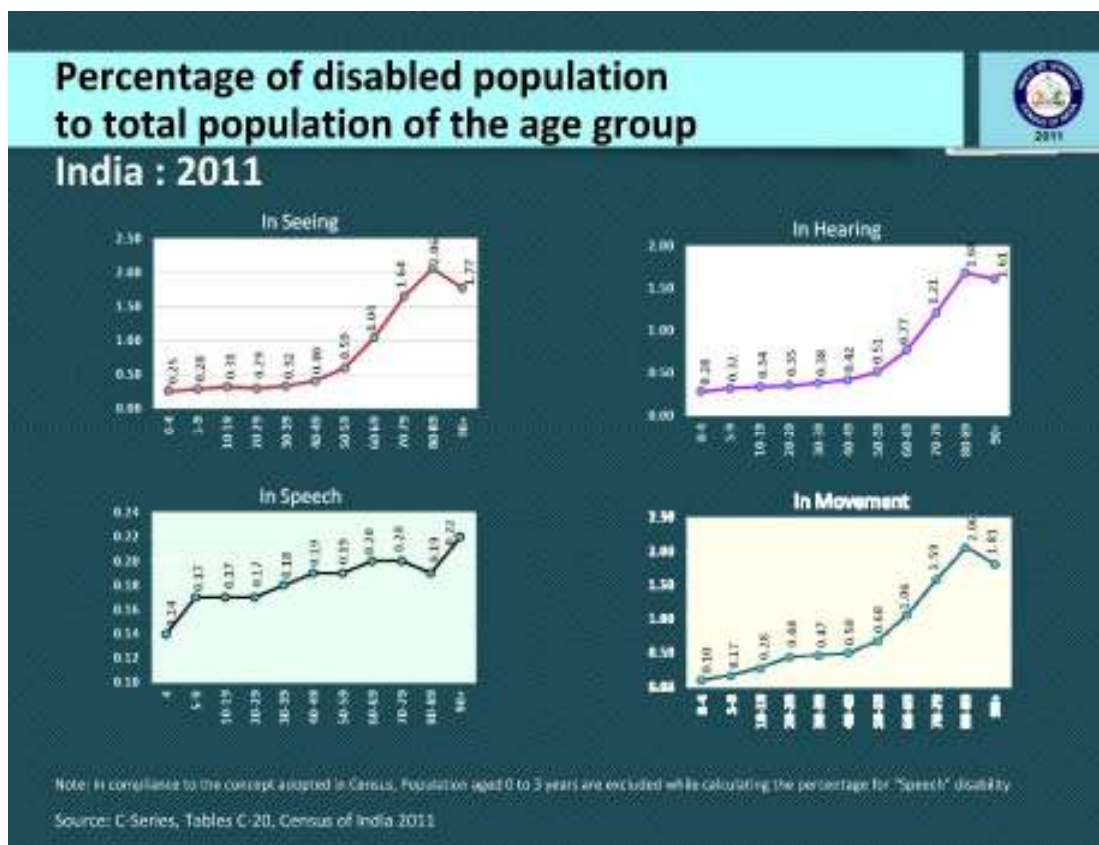
- i. Income enhancement for poorest of the poor families
- ii. Effective utilization of natural products. Instead of wasting the coconut shells, transforming them into an income generating product.
- iii. Improving social status for the poor families;
- iv. Avoiding migration to the cities, etc.

5. BRAILLE PRINTING

5.1 Overview:

What is Braille?

Braille is a method of printing dots on paper, so that blind people can read and write. Approximately 0.25% of the young population is blind or has seeing disability, according to the Census of India 2011 data.



The need to learn to read and write at a young age is a very important part of a good education. However, Braille printers, and the thick paper that these printers require, are fairly expensive.

World-wide, 90% of people who could benefit from reading and writing in Braille cannot afford the Braille books for reading, or the thick paper for writing Braille. This is a huge percentage of a group of people, who lack the opportunity of a good education to rise out of poverty.

5.2 Developing Tools for enhancing economic opportunities for women and youth entrepreneurs – Braille Books:

As part of our development of tools and products that can be made locally, and/or from environmentally friendly materials such as recycled paper,

etc., we help people to learn how to print Braille books and textbooks, so that they can earn a good income and become more self-sufficient, and so that blind people in their community would have the opportunity to learn to read and write Braille.

Last year, we designed low-cost, Braille printers, and reported on our progress in our 2019-2020 Annual Report, and in our website. The aim was to develop low-cost ways of printing Braille on plain, thin copy paper, using a desktop printer (see below) like an inkjet printer, but printing small dots of plastic or paste.

We thought that if we could put the dots on recycled copy paper (which is too thin for normal Braille embossed dots), then the paper cost for Braille books could be very low, or even free. We realized that it doesn't matter what is already printed on the paper, as people with vision problems simply feel the dots on the page and cannot see any of the already printed text on the paper. Recycled paper is a readily available, environmentally-friendly and cost-effective source of raw materials for Braille books.

Hence this type of sourcing of recycled paper can be sought from many xerox/copy shops and printers who throw away vast amounts of used paper as waste. Realizing that we have a very low-cost source of paper for Braille books is really encouraging! If we could create a corresponding savings in printers, then we could help people to make really affordable textbooks and books for blind children and people of all ages.

We are working to create a simpler, low-cost Braille printer prototype, for making text books and booklets at the village level. We are particularly interested in setting up entrepreneurs in villages, to print Braille booklets in local languages. We want to provide these booklets to homes, Anganwadi centers and schools so that children, teachers and Lady Sevikas can learn to read Braille.

5.3 Braille Printer Details:

5.3.1 Introduction:

Beacon AHEAD Institute tested several simple, low-tech devices for printing Braille this year.

The idea was to have a simple press, like a large chapati press. See Figure 1 below.

We wanted to have something that was simple to make locally, and easy to use, without mains electricity.

5.3.2 Design Focus for 2021:

This year, for serving the needs of blind people in rural India, we wanted to design an even more simple and accessible Braille printer.

For comparison, the pictures below show the evolution from last year's design to this year's design:

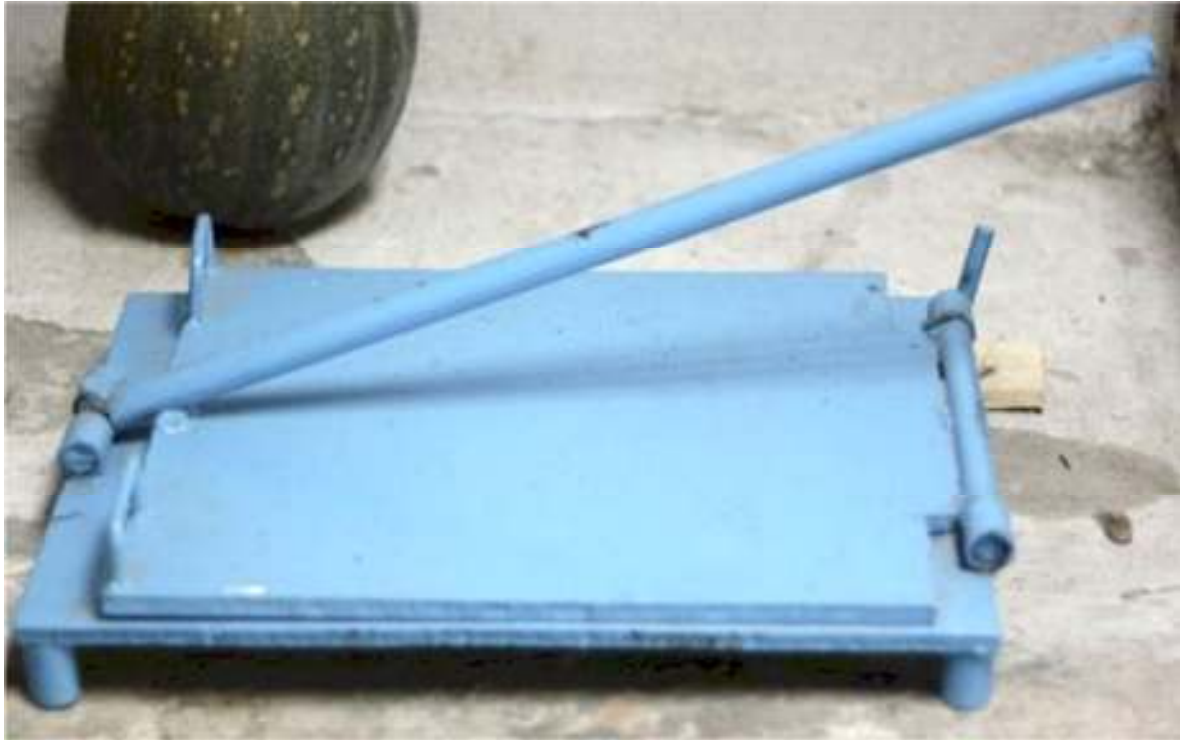


Figure 1 - Chapati Press large enough for A4 size pages

Braille Printer 1st Design, 2020



Braille Printer 2nd Design, 2021



These presses (above, right) are simple to make, but there is always some looseness in the hinges. To compensate for that, we decided to use a rubber sheet, of 3- or 4-mm thickness approximately, on the top plate of the press.

No matter where the top plate comes down on the paper, the rubber sheet will press the paper down and form all of the dots on the base plate. The rubber sheet is soft, so that it will be very quiet to emboss Braille pages with this press.

5.3.3 Thicker Paper Options:

We really liked the low-cost source of recycled copy paper, but copy paper is only 60 or 70 Grams per Square Meter (GSM) weight and too thin. When dots are embossed in copy paper, they are quite easy to squish, by pressing down on the dots with a fingertip.

The dots should be strong enough to last for years in a book. That is why Braille paper is thick: about 140 GSM weight, or twice the thickness of copy paper. Twice the thickness equates to two sheets of free copy paper, which is still free! So, we researched low-cost ways to glue two sheets of copy paper together, to make one page in the correct thickness for Braille embossing.

We found an affordable and environmentally-friendly glue in traditional Japanese woodworking. In Japan, rice paste is a common glue for attaching paper to wooden frames in home walls and screens, and in lamp shades. We also researched ways to make the rice paste into a long-lasting glue, and found that a pinch of salt can be added as a preservative in the rice paste.

The ingredients for rice paste are cooked white rice, water and salt. A small amount of left-over cooked rice can be used to glue dozens of pages together. The cooked rice is ground into a paste after adding the water and salt. A fine strainer or a juicer might be a good idea, to remove any lumps in the rice paste. The rice paste should be very smooth, as any small lumps between the papers ends up feeling like a Braille dot, too.

After seeing these dot-sized lumps between the two pieces of copy paper, we realized that, before gluing, we could emboss each sheet of copy paper, and then glue them together back-to-back, with rice paste filling the backs of the dots, to strengthen them, since they are only formed in thin copy paper. This way, we could print double-sided Braille pages, quite affordably, and quite easily, as we are only embossing thin copy paper, and not full thickness paper.

The challenge is to find a way to dry these double-sided pages flat, since it is difficult to press them flat but not to crush the dots at the same time. So, we are not currently pursuing this promising approach. We will revisit this idea later.

Instead, we are focusing on embossing the thicker paper made from two pieces of copy paper glued together with smooth rice paste, and flattened in a stack during drying of the rice paste.

5.3.4 Embossing Options:

The next step was to create a pattern of dots that could be embossed into the full thickness Braille paper, either regular 140 GSM Braille paper, or our new and affordable “double copy paper with rice paste Braille paper”. There were several ways that we explored to do this:

1. **Small Balls and Template Cards:** Use 1.5 mm (or 0.059 inch) diameter balls (such as bicycle ball bearing balls) to form the dots in the paper. Also use a template card that has holes in it, corresponding to where we want a dot to be. The balls fall through the holes into half round sockets in the base plate. The template card is removed, revealing the top halves of the balls arranged in the correct places in the base plate. Many pages can be printed with this arrangement of balls. When it is time to print the next page, all of the balls can be poured out of the press into a tray. A new template card, for the next page, is placed on the base plate, so that the next arrangement of balls can be laid out on the base plate, quickly and easily. The template cards are easy to make, and can be reused indefinitely. The balls are also reusable and about 2,000 or 3,000 balls would be needed in total.

The photos below show a small prototype Braille printer and template card, for testing this new concept. For the prototype, we used mustard seeds instead of steel balls, as these were readily available. The mustard seeds are about the right diameter, and they are strong enough to print several pieces of paper without breaking.

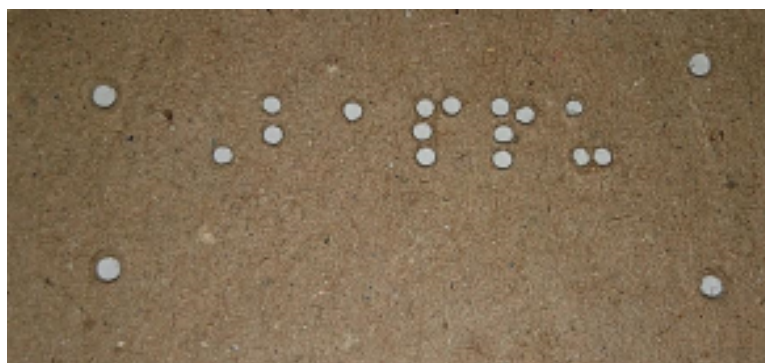


Figure 2 – Template card for 1.5 mm balls



Figure 3 - Template in small prototype printer



Figure 4 - embossing paper in the printer



Figure 5 - Paper embossed in printer



Figure 6 - Braille printing result

- 2. Form dots into a thin sheet metal template.** In this printer, the dots are fixed into a piece of sheet metal. One sheet metal template is required for each page in the Braille book being printed. Large, expensive Braille embossing machines use these sheet metal templates for Braille printing. We wanted to create a simple way of making these templates, locally, so that anyone can print whatever they want, in their language of preference, without needing an expensive machine.

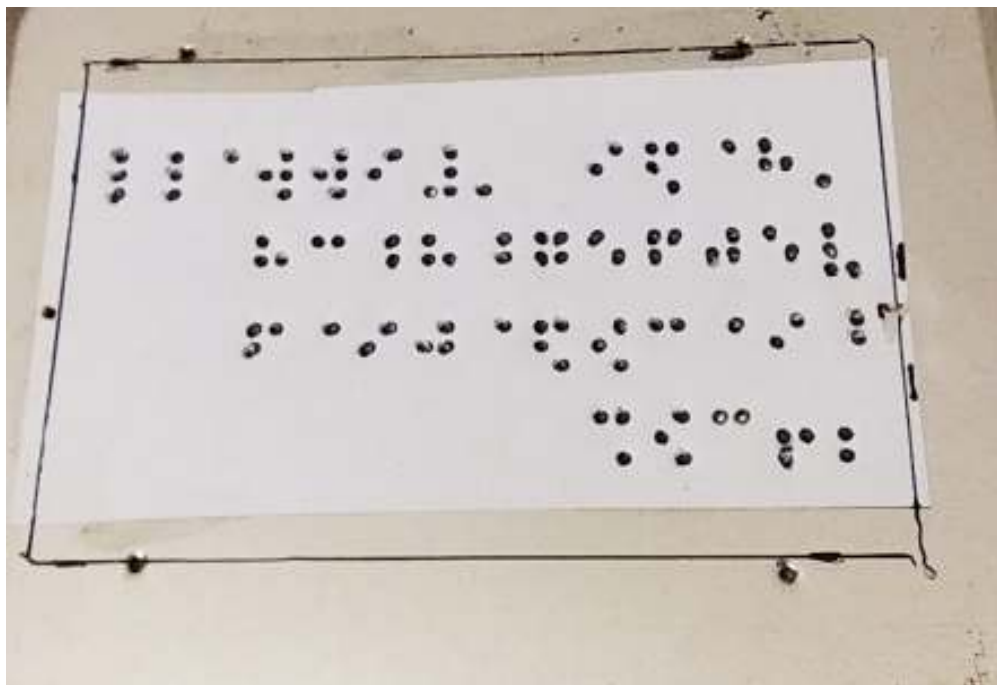


Figure 7 - Sheet metal template for a visiting card, showing the paper pattern for embossing it



Figure 8 - Braille Printing on a 170 GSM visiting card

The Template Embosser (see the next section, below) is a simple tool that allows dots to be embossed in the template accurately, one at a time. A paper pattern, with the dot locations can be glued to the template, so that the dots can be easily formed in the sheet metal. The sheet metal has holes in it, near each corner, to fix the sheet metal on guide pins, on top of the printer's base plate. The guide pins also align the paper in the printer, so that the printing is consistent and neat. An extra guide pin near one corner assures that the template is placed right side up in the printer.

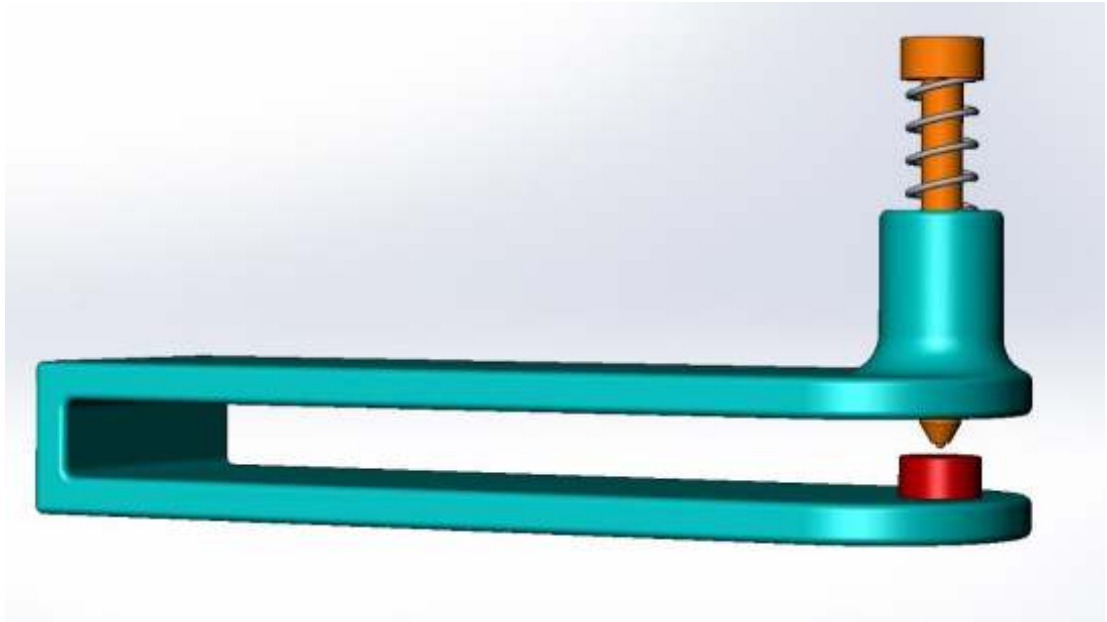
Conclusion: For embossing dots in paper, and for making many books at once, we think the **sheet metal template** (option 2 above) is the simplest to learn, and the most error proof method to be used at the village level.

5.3.5 Embossing the Sheet Metal Templates:

We chose the sheet metal template method for embossing the Braille pages, for the reasons stated above. Next, we needed an easy and flexible way to make these templates.

A quick way to make the sheet metal templates is with a **Template Embossing Tool** for each dot. (See figure 2 below.) We glue a paper pattern to the sheet metal, and stamp the dots into the metal, by tapping the

Stamp Pin (in orange) with a hammer or mallet at each dot printed on the paper.



*Figure 9 - Template Embossing Tool –
for making dots in sheet metal templates*

To begin, we drill the corner holes into the sheet metal (that align with the posts in the printer) and then line up the paper pattern to those holes. Once the paper pattern has been glued to the sheet metal piece, we can tap the Embossing Tool pin at each dot printed on the paper. In this way, the sheet metal piece can be fabricated without electricity or complicated machines. Anyone can print out more copies of the paper patterns that Beacon AHEAD will provide, and make more templates of new books.

This method can be used to make reusable sheet metal templates, which can be used again and again, year after year. The Dot embossing tool can also be used to repair damaged dots in the template, or make necessary corrections in the template, if a dot was left out of the template, for example.

5.4 Braille Printer Costs and Impact:

5.4.1 Direction and Cost estimate for improving the machines and products:

- i. Collaborate with Blind schools, Government and organizations that help blind people to have better access to Braille textbooks and storybooks.
- ii. Tie up with entrepreneurs and manufacturers to build these printing machines, to further increase jobs and livelihoods.
- iii. Link up with Micro-finance and other groups to help low-income people and/or entrepreneurs to purchase the printing machines from local manufacturers for Rs. 4000 or less.
- iv. This would include training, support, and machine maintenance.
- v. We also would like to make the machine and programming it, an open-source project, so that others can design better printing machines. In this way, the project can grow organically.

5.4.2 Impact:

- i. Improved literacy and education for blind and vision impaired children.
- ii. Enable blind children to have access to inclusive and quality education and inspire them to have creative imagination.
- iii. Providing better and affordable means for Schools and Anganwadi Centers to have Braille education textbooks for the blind children.
- iv. Income enhancement for poorest of the poor families
- v. Effective utilization of recycled paper products;
- vi. Improving social status for the poor families;
- vii. Avoiding migration to the cities, etc.

All the above are in alignment with Sustainable Development Goals under Human Development – SDG 4 (Quality Education).

6. Way forward:

6.1 Renovating ICDS Anganwadi Centres and Building 10 BEST Toilets:

- Take this project forward, to complete the renovation of three ICDS Anganwadi Centres, and building 10 BEST Toilets.

Photos of on-going renovation and toilet panel precasting:

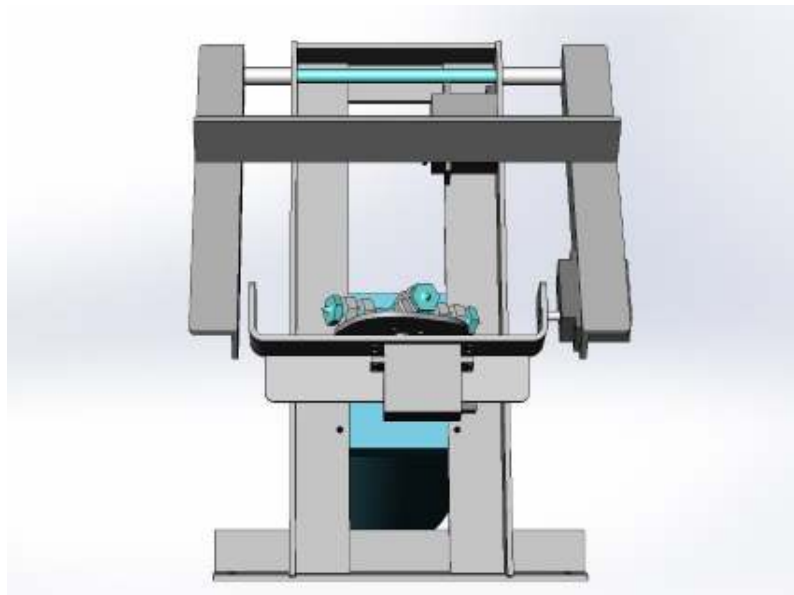


6.2 Coconut Carving Machine Evaluation:

- Build more 2nd generation prototypes, for training and evaluation in homes.
- Provide training for using the machine, to let people use this machine to carve coconut shells in their homes.
- Provide training for maintaining the machine.
- Share drawings with local manufacturers, to make the machines better and to improve quality of manufacturing.

6.3 Coconut Carving Machine Improvements:

- Build a 3rd generation prototype, based on what we learned with the first two prototypes:
 - ✓ Include feedback from users, on how to make using the machine even easier.
 - ✓ Incorporate a grinder for smoothing the coconut exterior, into the machine, so that a rough coconut can be completely prepared and carved with the press of one START button.



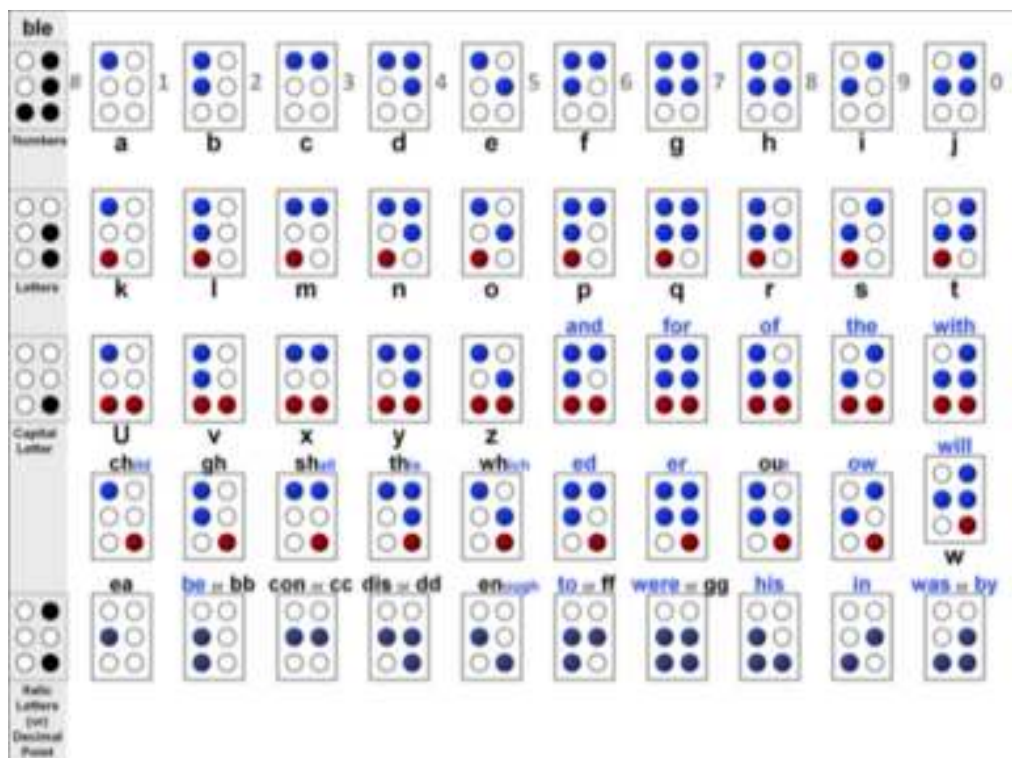
- ✓ Evaluate other raw materials and products that could be made with similar Computer-Numerical-Controlled (CNC) machines, to help other low-income people to have increased income with less strenuous work.

6.4 Braille Printer Evaluation:

- Build 2nd generation prototypes, for training and evaluation in homes.
- Provide training for using the Braille Printers, to let people use this machine to print Braille books in their homes.
- Provide training for maintaining the machine.
- Share drawings with local manufacturers, to make the machines better and to improve quality of manufacturing.
- Print copies of the “*How To Read Braille*” Booklet (see Annexure 1, below), to get feedback and further improve this learning tool.

6.5 Braille Printer Improvements:

- Build a 3rd generation prototype, based on what we learned with the first two designs:
 1. Include feedback from users, on how to make using the Braille Printer even easier to use.
 2. Develop an app for phones, so that the printed pages can be scanned and checked against the original book pages, so that any errors in printing can be caught and corrected.
- Evaluate other books, texts, brochures, signs and other teaching materials that could be made with similar Braille printers, to help other low-income people to have increased access to education, mobility and reading.
- Explore options to make learning Braille easier in other languages, such as expanding into other languages the Braille alphabets in this picture, (shown with the most common English abbreviations), and as explained in the Annexure 1 below:



Braille Alphabet and Abbreviations (from BPA India)

6.6. Replication:

- Replication of best practices of Beacon Ahead Institutes programs in other states with support from Government, Corporate Social Responsibility agencies and other funding sources located within India.

6.7. Agriculture:

- Encourage innovation and improvements regarding production, harvesting and good soil quality. Develop new products to help farmers, such as improved scythes, honey bee boxes, ovens for producing bio-char, etc.

6.8. Art and Design:

- Help foster and encourage creative people in India, with skill sharing, networking and training.

7. Financial Audit and Compliance

Beacon AHEAD Institute's finances were audited for the full annual year. The audit was performed by NVS Murty and CO., Chartered Accountants. Records of this audit are on file with them and with Beacon AHEAD.

8. Annexures

ANNEXURE 1

Braille Booklet

The following pages show a hybrid book that is both printed in text and embossed in Braille.

This book is intended to introduce family members to Braille.

It can be printed in any language, and the Braille embossing of words and alphabets can be embossed in the corresponding language.

It is our intention to make these booklets available to deserving families, in case there is a family member, such as a small child, or an elderly parent, who has difficulty reading books. This booklet will help people to learn the Braille alphabet.

How to Read Braille

Beacon AHEAD Institute



Beacon AHEAD Institute

How to Read Braille

Compiled By Beacon AHEAD institute Team Members

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Edition Nov. 2021, v.2

Web Site BeaconAHEAD.com

For More Copies info@BeaconAHEAD.com

2

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How to Read Braille

If you cannot see to read printed books

Braille is a way of printing, reading and writing that uses bumps or 'dots' on pages or signs. If someone is blind, or can't see well enough to read printed words, they can instead feel the dots with their fingers.

Once you learn the alphabets and some abbreviations, you can read anything printed in Braille. You can read at night, with no lights on!

Books, textbooks and signs are printed around the world in Braille. Braille is the international standard for printed books and documents for blind and vision impaired people. And Braille is available in all the major languages of India!

In each Braille alphabet, the dots are arranged in a grid that is 2 dots wide and 3 dots tall. There can be up to 6 dots in one alphabet, and it looks like this, ⠠⠠⠠⠠⠠⠠ - which is "friend" in Braille. The dot positions are numbered 1 to 6, starting with 1 in the top left corner, and 2 and 3 are below it. 4 is in the top right corner, with 5 and 6 below the 4:



Figure 1 - Numbering the dots in Braille

The first ten alphabets use only the top four dots, ①, ②, ③ and ④. The next ten alphabets repeat the same pattern, with the ⑤ dot added in the bottom row. And the next five alphabets after that repeat a similar pattern, except for 'W', with both bottom dots (⑤ and ⑥) added.

'W' does not fit into the pattern, because it was not in French, and the original Braille comes from France.

The whole A to Z alphabet looks like this:

3

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4

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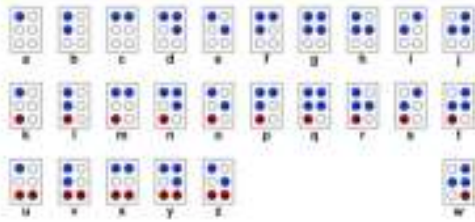


Figure 2 - Braille Alphabet (modified from BPA India)

The basic pattern of the top four blue dots repeats in each row above. So, it's good for us to learn that pattern, with a fun story about the first row with the alphabets from A to J:



Figure 3- First Ten Alphabets (modified from BPA India)

"We Approach a river in a car, and find a Bridge, but it's Closed, so we take a Detour."

- See how the shape of the bridge and the closed sign are like the two blue dots in B and C alphabets.
- The three dots in D are like the arrow in the detour sign.

- And A is the simplest alphabet with just dot ①.

Continuing the story: "We realize that our tank is Empty and we need more Fuel, but there is a Gridlock of too many cars."

- The two blue dots in E are angled up and to the left, like an arrow in a fuel gage when the tank is Empty.
- The three blue dots in F are similar to the shape of the letter 'F' for Fuel.
- And all of the top four dots are blue in G, like when the traffic fills the roads during Gridlock.

And finishing the story: "We get on a Harley motorcycle, switch on the Ignition, and ride up a ramp to Jump over the river!"

- The three dots in H are like the two wheels and a rider above on a Harley motorcycle.
- The two dots in I are angled up and to the right, like a key in an ignition switch.
- And the three dots in J are like a ramp that you could go up quickly to Jump in the air!

And that's a fun story for learning to remember the first ten alphabets, A through J, in Braille.

Next, we need an easy way to remember the next letters in the Braille alphabet. The next 10 alphabets, from K to T are the same as the top four dots in the alphabets A through J,

and with dot ② added in the bottom left corner of each of the alphabets from K through T.

The alphabets U, V, X, Y and Z follow the same pattern as A through E, with both bottom dots (② and ③) added to the bottom of the alphabets.

On the next page, you can see and/or feel the dots of the Braille alphabets.

The rest of this book is printed in words and in Braille dots, so that everyone can learn about Braille. Families can help a child or a parent, who is having difficulty seeing, to learn about the Braille alphabet. Parents at home, teachers in schools and Sevakis in Anganwadi Centres can help little ones, children and family members to start learning Braille alphabets.

The first page shows the alphabets, from A to Z, and then W at the very end. These are listed in rows of 10 alphabets per line, so that you can notice the similarities of the alphabets that are above each other in the same column.

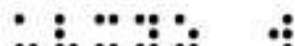
The alphabets in Braille:



a b c d e f g h i j



k l m n o p q r s t



u v x y z w

Some sample words in Braille:

⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

water is fun

⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

to splash in

⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

we love it

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We hope you enjoyed learning about Braille!

For more information and to contact us at Beacon AHEAD Institute, please visit our web page at:

BeaconAHEAD.com

Beacon AHEAD Institute is a non-profit, Registered Trust in India which works for the social development of India by creating innovative products that help people in need and bridge the gap between low cost, eco-friendly technology and community development.

We aim to create access to better livelihoods and improve the quality of life for low income communities. We work in close collaboration with the Government of India and other social development agencies for providing better hygiene, sanitation and self-employed livelihoods through innovative products for the people of India.



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Contact Information:

Beacon AHEAD Institute –
Hyderabad office:
Ishaq Colony, Picket
Secunderabad, TS – 500015

Beacon AHEAD Institute –
Bengaluru office:
3rd Cross Road
Opposite Rani Park,
Wilson Garden
Bengaluru, KA – 560027

Contact Name: Priyam Varma, CEO
Email: info at BeaconAHEAD dot com
Website: www.BeaconAHEAD.com

