



Editor's Desk

I hope all of us did our best to keep ourselves safe during the COVID-19 outbreak! As per our prime minister, we fought Corona virus by keeping ourselves locked within our "Laxman Rekha". This newsletter is the outcome of several online sessions during lockdown period when we used to meet weekly. Even though we were locked at our homes, but our spirit did not stop us to get this July 2020 newsletter on time.

This newsletter has a special section which is the outcome of our deep thought as to how we can get to the grassroots, i.e., reach the minds of the villagers who are the real users of the technologies we work upon. We felt if a villager finds something in a local language or in his/her mother tongue he/she will take immediate interest to read it rather than discarding it if it is only in English. On the other hand, the local educated people also MUST be motivated to reach to their "INNER" land. Hence, we floated this idea in our RuTAG office and to the RuTAG IIT Delhi club members. All appreciated it. Including me many of us took responsibilities to translate one article ONLY from our Jan. 2020 issue. We added a section in this issue called "*A Multilingual Glance at Our Recent Newsletter (RuTAG IITD News, Vol. 8, No. 1, Jan. 2020)*". I hope the readers will appreciate it and enjoy one or more of those if they can read the language(s). We did other experiments by translating the complete issue of Jan. 2020 in Bengali and Odia by an organization in Kolkata and a research scholar at IIT Kharagpur, respectively. Again, the motivation is the same as above. In addition, we wanted the students from polytechnic and other local engineering colleges to get acquainted with such rural technologies which are possibly needed by their neighboring communities. Since those students are expected to be more comfortable in local languages the translated RuTAG newsletters will create more interest in them, and it will be for them to approach a local artisan/farmer, or even a local administrator. The basic philosophy here is how to empower/motivate our students and make them towards their own problem-solving attitude to become entrepreneurs and job-providers than jobseekers towards better livelihoods through creativity.

Jai Hind!

Prof. Subir Kumar Saha

Chairman's Column

Decentralized and Eco-friendly Rural Industrialization - now Becoming an Emergency

More than hundred years ago, Mahatma Gandhi, in his seminal and visionary booklet 'Hind Swaraj' had clearly warned against the dangers of modern development with highly centralized and high-tech industrialization pattern. Particularly for our country, Gandhi Ji had categorically indicated the need for developing decentralized, eco-friendly, and self-sufficient rural economy focusing primarily on cottage industries. And it is also true that before the advent of British rule, traditional rural India did have a self-sufficient economy with adequate employment opportunities. Unfortunately, after independence, this could not be achieved under the over-riding pressures of modern development globally.

As a result, we have also moved on the path of technology-intensive urban-centric industrial development which is now exhibiting its detrimental effects in multiple ways. Such a developmental pattern has impoverished the rural sector and has forced high degree of migration of manpower to the urban areas in search of employment. This ever-increasing trend is creating havoc in both the urban as well as the rural sector and the crisis resulting from this trend are ever increasing. In the prevailing Corona calamity also, the worst-affected section of population has been the large multitude of migration labor and small entrepreneurs. It is becoming increasingly evident that decentralized industrialization of the rural sector providing local employment stability to the rural population must be urgently taken up. Recently, in order to cope with the present economic debacle, Hon. Prime Minister has also stressed on becoming economically 'Aatma-Nirbhar' and the government is launching various initiatives to augment rural employment opportunities. Along with the requisite thrust in the government policies, the present situation also presents a big challenge for the technical R&D community to evolve appropriate technological packages, rural entrepreneurship models, marketing strategies etc. to promote decentralized and sustainable rural industrialization.

In this context, it is worth mentioning that a pilot project focused towards promoting R&D network for rural industrialization was executed by IIT Delhi under the sponsorship of KVIC and MSME, Govt. of India from 2001-2008 which resulted in the development of MGIRI (Mahatma Gandhi Institute of Rural Industrialization), Wardha along with a network of 15 Technical Interfaces in the apex technical institutions of the country. In the process, a number of appropriate technological packages suitable for rural industrialization was also developed. It is high time that R&D work of this nature is provided substantial thrust at a large scale.

I wish to suggest that all the RuTAG centres should join hands to carry out serious brain storming and evolve suitable strategies to work in this direction.

Prof. R. R. Gaur



Figure 1: SSPV being retrieved without disturbing soils



Figure 2: PTC based spice roasting set-up

1. Truncated Unglazed Percolative Clay Ceramic Ware as a Modified Pitcher Irrigation System

PI - Dr. Anand Plappally, Department of Mechanical Engineering, IIT Jodhpur

Collaborating NGO - S. M. Sehgal Foundation (Rajasthan Branch Office) Gurugram, Haryana

Communities residing in arid regions of India had practiced pitcher irrigation for ages and was considered good for horticulture. In this case, water filled pitchers with almost spheroid bodies and constricted neck were placed just below the soil surface. Plants were planted around the pitcher covered with a lid. The plant roots retrieved water which permeated through its porous walls with time. This process made the horticulture water efficient and reduced evaporation losses. Although pitchers are effective, they disturb the soil when they are to be removed. With its spheroidal shape, manufacturing of pitchers with high porosities (high rate of permeation to effect saline soil remediation) cannot be achieved effortlessly. In order to overcome some of these drawbacks, a frustum shaped porous ceramic vessel with larger radii at its top and a smaller radius at its bottom was developed. Frustum shaped sub-surface porous vessel (SSPV) allowed practice of conservation agriculture. Thickness, strength, and porosity of the vessel can now be modified corresponding to the soil character at a specific location. Field trials indicated that SSPV (Figure 1) hybridized with organic manure gave 80-90 % productivity compared to yields from a fertilized (chemical) flood irrigated field. A rise in organic carbon and steep decrease in soil salinity were also observed in the field. This technology has been adopted by Government Ambedkar Hostels in Jodhpur District under the Social Justice and Empowerment Department, Government of Rajasthan.

2. Parabolic-Trough-Concentrator (PTC) Based Spice Roasting

PIs – Prof. Satish B. Agnihotri, and Prof. Vishal Sardeshpande, CTARA, IIT Bombay

Collaborating NGO – Samyak Spice Cluster Association, Jalna, Maharashtra

Production of masala, a spice blend used in many Indian dishes, involves the roasting of spices. Roasting of spices is a high-precision activity that requires a skilled operator for control of the heat source, control of the stirring rate, and knowledge to decide the degree of roasting for making a high-quality roasted product. High cost heat sources like LPG (Liquefied Petroleum Gas) or electricity are preferred for roasting, as these heat sources have fast and easy heat control. The small businesses of making spices are generally operated by self-help groups (SHG) or individual entrepreneurs. These small roasting businesses face three main challenges - high fuel costs, skilled operator's drudgery, and inconsistent quality of products.

Present project is an attempt to address these challenges through introduction of the solar roaster. Automated operation of the solar roaster can reduce the cost of heating, eliminate drudgery for skilled labourers, and help achieve consistent quality of roasted products. This will then lead to better retention of skilled labour in the roasting profession and a more consistent customer base due to the higher-quality product. The objectives include investigation of performance of solar roasting for achieving desired quality, and also testing impact of solar roasting on productivity and output. The extent of drudgery reduction in comparison with the LPG based heating will also be evaluated. The deliverables include design, fabrication and testing the field-efficacy based on above mentioned points of solar roaster.

RuTAG Technology Commercialization Programme through FICCI

RuTAG initiative so far has developed and demonstrated demand driven innovative technologies for different sectors of rural areas and few were multiplied and disseminated. RuTAG technologies would be able to reach out and useful if commercialized. Federation of Indian Chambers of Commerce and Industry (FICCI) through its C-Tech (Centre for Innovation Science and Technology Commercialization) established in 2007 has been providing a platform and institutional framework to Indian innovators and entrepreneurs, helping them convert their ideas into businesses. The Centre has recently constituted a power-packed Innovation and Technology board to mentor FICCI C-Tech's programs and activities. These innovations are scaled up, not only in India but also in other developing countries, e.g., Africa and South Asia, along with positively impacted countries like Rwanda, Kenya, Ethiopia, Bangladesh, Uganda, Nepal, and Afghanistan.

The technologies developed under the RuTAG (Rural Technology Action Group) centres at seven IITs would be commercialized through FICCI with the support from the Office of the PSA. In its first meeting (online) on April 14, 2020, the officials from the office of the PSA, FICCI, and RuTAG Centres discussed the future course of action. The RuTAG Technology Commercialization Programme aims to support the selected RuTAG Technologies, responds to the needs of rural markets by identifying and commercializing technologies from the RuTAG portfolio that best address the needs and create sustainable impact on the targeted rural communities in India, Africa and BIMSTEC nations [1]. Commercialization will be done by connecting RuTAG technologies with Social Entrepreneurs/SHGs/Industry on case to case basis. The plan is to commercialize at least six technologies in India and four in BIMSTEC countries. The move is expected to add real commercial value of the RuTAG efforts made by various IITs since 2004 when it was first established at IIT Madras, particularly, in the post-COVID period when many labourers have gone to their villages. Such technological introduction connecting with a good business model will certainly de-congest the cities, thereby, improving the quality of lives for both the migrant workers who will now add value to their villages, and the city dwellers having less issues related to overcrowding.

[1] The Bay of Bengal Initiative for Multi-sectoral Technical and Economic Cooperation (BIMSTEC) comprising Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand & African countries.

Dr. Ketaki Bapat, Office of the PSA, Govt. of India

Regional Workshop of RuTAG IIT Delhi Held at Mathura on December 16, 2019

RuTAG IIT Delhi conducted a regional workshop on December 16, 2019, in collaboration with Human Social Welfare Society, Hathras at Mathura [Figure 3(a)]. The program was attended by 60 participants, which included Prof. R. R. Gaur, Hon. Visiting Professor, NRCVEE, IIT Delhi and Chairman, Core Group, RuTAG IIT Delhi, Prof. S. K. Saha, Professor, Dept. of Mechanical Engineering, IIT Delhi, and Coordinator, RuTAG IIT Delhi, Prof. M. R. Ravi, Professor, Dept. of Mechanical Engineering, IIT Delhi, and Co-coordinator, RuTAG IIT Delhi, Prof. Sangeeta Kohli, Professor, Dept. of Mechanical Engineering, IIT Delhi, and Co-coordinator, RuTAG IIT Delhi, Mr. Davinder Pal Singh and Mr. Yashwant Prasad, Project Associates, RuTAG IIT Delhi, Mr. Raj Kumar Gupta, Senior Project Assistant, RuTAG IIT Delhi, Mr. Mangal Sharma, Junior Project Attendant, RuTAG IIT Delhi, Mr. Suraj Bhat, Research Scholar, IIT Delhi, Mr. Abhishesh Kumar and Mr. Sanket Beniwal, B. Tech Students, IIT Delhi. Mr. Davinder Pal Singh anchored the workshop. He first welcomed the delegates and participants.



Figure 3(a): Group photo of participants of RuTAG regional workshop held at Mathura



Figures 3: (b). Mr. Laxman demonstrating the new Tulsi Mala Making Device, (c). New Tulsi Mala Making Device given to Mr. Dharmendra of HSWS

Prof. S. K. Saha welcomed the participants and briefly explained the agenda of the workshop. He explained the mechanism and role of RuTAG IIT Delhi in technology up-gradation for rural India. He mentioned that this workshop primarily focused on Tulsi Mala Device. Prof. Gaur welcomed everyone and mentioned the importance of the role of premier institutes such as the IITs in research on rural areas. Prof. M. R. Ravi spoke about the various furnace-related technologies developed by RuTAG IIT Delhi. Some of the technologies discussed were – Glass Bangle Furnace, Terracotta furnace at Kondagaon, and Dhokra craft furnace. Various participants gave presentations on their work and elaborated the problems in which RuTAG IIT Delhi can provide technological solutions.

Since this workshop focused on Tulsi Mala Device, a dedicated session on Tulsi Bead Making was organized. In this session, the participants, through interactive sessions, learned about the new device, its development, assembly and learnt how to make beads on the new device. Ms. Omwati and Mr. Laxman, artisans from Bharatpur and Mathura, respectively, demonstrated [Figure 3(b)] how beads could be done using both the DC powered and AC powered devices. Participating artisans were invited to try out the machine and make beads on it. All the artisans succeeded in using the newly developed machine and made beads.

Prof. Saha concluded the training and demonstration session by thanking all the artisans. He also thanked Mr. Devendra, who is the carpenter for helping to manufacture and assembly the device. New machines were given to Mr. Punit Kumar (Lupin Foundation) and Mr. Dharmendra (HSWS) [Figure 3(c)]. Mr. Hemant Sharma said that Lupin Foundation will further assist in dissemination and spreading awareness about the newly developed machine.

Mr. Yashwant Prasad, Project Associate, RuTAG IIT Delhi

Field Trial of Sheep Hair Shearing Machine Developed by IIT Delhi at USWDB, Rishikesh, Uttarakhand

RuTAG IIT Delhi team comprising of Mr. Ashish (Jr. Project Assistant tech.), and Mr. Davinder Pal Singh (Project Associate) visited Uttarakhand Sheep and Wool Development Board (USWDB), Rishikesh, Uttarakhand (Figures 4a and 4b) during January 10-14, 2020 to test and demonstrate the components of sheep shearing device along with ten-teeth comb and three-teeth cutter manufactured by different vendors under the guidance of RuTAG IIT Delhi.



Figures 4(a) and (b): Mr. Chandermohan Bhat shearing the sheep using IIT Delhi device

USWDB Officials Mr. Hitender Yadav and Mr. Jitender came to pick up RuTAG IITD team from USWDB Guest House. The shearing location was at Bhogpur in Bhaniwala Forest Range. The location was very remotely accessible and was in the middle of a very dense forest. There was no electricity available. Therefore, USWDB team arranged two small generators of 5A, 230V output. USWDB team installed two imported device sets at the shearing location. There were two shearers assigned for the shearing of the flock at the camp. The total flock available was of 400 sheep. The sheep breed was called “Gaddi”. It is a cross breed of Marino Sheep (Australian) and Desi sheep (Indian). Mr. Chandermohan Bhat (Shearer) of age 59 years from USWDB was assigned to use the RuTAG IITD device. RuTAG IITD team installed their device and the shearing started as soon as the generators were turned on. The device performed very well. The motor performed very well, and the combs and cutters manufactured by machining process performed excellently. The best performance of one set was shearing of 13 sheep without changing/grinding which is far above the performance of the imported comb and cutter. The imported combs and cutters need to be changed every 3 sheep (as per the observance at the shearing camp and according to USWDB Officials), however, IITD combs and cutters sheared a maximum of 13 sheep without changing/grinding

Mr. Ashish Dahiya, Jr. Project Assistant (Tech.), RuTAG IIT Delhi

Major Problems of Indian Agriculture

India is the world's largest producer of milk, pulses, and spices, and has the world's largest cattle herd as well as the largest area under wheat, rice, and cotton. It is the second largest producer of rice, wheat, cotton, sugarcane, farmed fish, sheep and goat meat, fruit, vegetables, and tea. The country has some 195 m ha under cultivation of which roughly 125 m ha are rainfed while 70 m ha are irrigated. In addition, forests cover some 65 m ha of India's land. Nearly 75 % of India's families depend on rural income. The food security of the country depends on producing cereal crops like wheat, paddy, soya bean, oil seeds etc. and increasing the production of fruits, vegetables, and milk with constantly increasing demands. The Indian agriculture has several problems which are outlined below. These problems need to be solved with a sense of urgency.

1. **Scarcity of Water:** Scarcity of water and underutilization of existing irrigation resources is a matter of concern.
2. **Illiteracy and Inequality and Lack of Finances:** Illiteracy, lack of awareness about recent developments in the field of agriculture, and poor socio-economic background of the farmers are some of the fundamental reasons for continuously decreasing agricultural productivity.
3. **Small and Fragmented Landholdings:** A seemingly large sown area of 141.2 m ha becomes insignificant when we see that it is divided into economically unviable small and scattered holdings. The size of the holdings will further decrease with the infinite Sub-division of the land holdings. This problem of small and fragmented holdings is more serious in densely populated and intensively cultivated states like Kerala, WB, Bihar, and eastern part of U. P. where the average size of land holdings is less than one ha or less than even 0.5 ha.
4. **Seeds:** Good quality seeds are out of reach of small and marginal farmers mainly because of their exorbitant prices. National Seeds Corporation (NSC) and 13 State Farmers Corporation now supply improved seeds to the farmers.
5. **Manures, Fertilizers and Biocides:** Average yields of almost all the crops are among the lowest in the world. This problem can be solved by using more manures and fertilizers. Cow dung provides the best manure to the soils. But its use as such is limited because much of its use as the kitchen fuel in the villages as dung cakes. Reduction in the supply of firewood and increasing demand for fuel in the rural areas due to increase in population has further complicated the problem. Chemical fertilizers are costly and are often beyond the reach of the poor farmers. The country has a potential of 650 m tonnes of rural and 16 m tonnes of urban compost which is not fully utilized at present. The utilization of this potential will solve the problem of waste disposal as well as providing manure to the soil. Biocides (pesticides, herbicides, and weedicides) in the proper amounts have to be used to save the crops from pests, germs and weeds and thus avoid losses.
6. **Infertile Land and Lack of Infrastructure in the Agriculture Sector:** Contamination of soil due to increasing level of river and canal pollution caused by high industrial effluents and toxic metals is decreasing the agricultural productivity. Further, soil erosion taking place at rapid pace is degrading the land. Inappropriate use of fertilizers and pesticides also causes lack of nutrients in the soil. Old fashioned equipment and practices used by farmers in India result in low yield for many agricultural commodities.
7. **Agricultural Marketing:** Agricultural marketing continues to be in a bad shape in rural India. In the absence of proper marketing facilities, the farmers have to depend upon local traders and middlemen for the disposal of their farm produce at throw-away prices. Such a situation arises due to the inability of the poor farmers to wait for long after harvesting their crops.
8. **Inadequate Storage Facilities:** Storage facilities in the rural areas are either totally absent or grossly inadequate. Under such conditions the farmers are compelled to sell their produce immediately after the harvest at low prices. Such distress sale deprives the farmers of their legitimate income. The post-harvest losses are about 9.3% of which nearly 6.6 % occurred due to poor storage conditions alone. Scientific storage is, therefore, very essential to avoid losses and to benefit the farmers and the consumers alike. At present there are number of agencies engaged in warehousing and storage activities. These agencies help in building up buffer stock, which can be used in the hour of need. A Central Government scheme also provides storage facilities to the farmers near their fields and in particular to the small and marginal farmers.

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9. **Inadequate Transport:** Cheap and efficient means of transportation in a large number of villages is not available. These villages are not well connected with main roads or with market centers.
10. **Conclusions:** Agriculture, in India is back bone of the whole economic system. It provides employment to millions of Indians besides providing necessary inputs for the industrial growth. It also supplies fodder for India's huge livestock and is a significant factor to earn foreign exchange. Therefore, measures such as timely availability of formal credit and other inputs to the farmers, creating the awareness about policies and programs of the government for educating the farmers should be available.

Prof. Keshav Kant (Retired), RuTAG, IIT Kanpur

RTDD 2020 at IIT MADRAS

The 2nd International Conference on "Rural Technology Development and Delivery"

The 2nd International Conference on "Rural Technology Development and Delivery" (RTDD-2020) was held on March 12-14, 2020 at IIT Madras. The conference was attended by Mr. Suraj Bhat, Mr. Yashwant Prasad, Mr. Raj Kumar Gupta and Mr. Davinder Pal Singh from RuTAG IIT Delhi along with officials from other RuTAG centres, Government officials, NGOs, academicians, students, researchers, and faculty members. 22 papers were presented under 8 technical sessions chaired by various experts. There were 7 invited sessions, lectures, and roundtable discussions by various experts from different walks of life. Developed technologies were showcased through exhibition and poster presentation by various organizations. Prof. Bhaskar Ramamurthi, Director, IIT Madras inaugurated the conference and delivered the welcome address [Figure 5(a)]. He mentioned that RuTAG has created a niche in rural development since its conception and has been working with prominent grassroot organizations in developing and disseminating technologies for rural India.



Figure 5(a): Prof. Bhaskar Ramamurthi (right), Director, IIT Madras



Figure 5(b): RuTAG IIT Delhi technologies on display



Figure 5(c): Mr. Yashwant Prasad presenting paper on Tulsi Mala Making Device

A panel discussion on "Technology Challenges in Rural Entrepreneurship" was held with a mix of panellists from incubation centres, academia, start-ups, CSR. The panellists discussed about the rural ecosystem and the possibilities for technology-based entrepreneurship, governance and regulation issues, uptake of technologies by the rural consumers and challenges for such enterprises. The event brought together around 150 like-minded participants to review the role technology in the rural development, expand the capacity to address current and future development challenges, inter-linkages between technology & policy. It also provided a valuable networking opportunity and offered a platform for further cooperation among the technology development institutions and technology dissemination organizations. RuTAG IIT Delhi exhibited its technology in the conference [Figure 5(b)]. Mr. Yashwant Prasad, Project Associate, RuTAG IIT Delhi presented a paper on Tulsi Mala Bead Making Machine [Figure 5(c)]. To encourage students to participate in the conference, internal students were supported to present their ideas and technologies related to rural problems. Many of the students also volunteered for the conference activities. Students and research scholars accounted about half of the participants.

Mr. Sreenivas Chigullapalli, RuTAG IIT Madras

Projects

A woman in a white headscarf and dark clothing is operating a manual flour mill. The mill is yellow and green, with a hopper for grain at the top and a collection bag at the bottom. She is standing next to the mill, which is placed on a concrete floor. A large metal bowl is visible on the floor next to the mill. The background shows a simple room with a doorway and some hanging items on the wall.



Tamil

Design Improvement of Tulsi Mala Making Device - ತುಳಸಿ ಮಾಲಾ ತಯಾರಿಸುವ ಸಾಧನದ ವಿನ್ಯಾಸ ಸುಧಾರಣೆ

Kannada

ಮಧುರಾ ಸಮೀಪದ ಹಳ್ಳಿಗಳಲ್ಲಿ ಸುಮಾರು ೨೦೦೦ ಕುಟುಂಬಗಳು ತಮ್ಮ ಜೀವನೋಪಾಯವನ್ನು ಗಳಿಸಲು ತುಳಸಿ ಮಾಲೆ ಮಣಿಗಳನ್ನು ತಯಾರಿಸುತ್ತಾರೆ ಎಂದು ರುಟಾಗ್ ಐಐಟಿ ದೆಹಲಿ ಮಧುರಾದ ಜೈತ್ ಗ್ರಾಮದಲ್ಲಿ ಹ್ಯೂಮನ್ ಸೋಶಿಯಲ್ ವೆಲ್ವೆರ್ ಸೊಸೈಟಿ ಸಹಯೋಗದೊಂದಿಗೆ ನಡೆಸಿದ ತುಳಸಿ ಮಾಲೆ ತಯಾರಿಕೆ ಸಾಧನವನ್ನು ಪ್ರದರ್ಶಿಸುವ ಕಾರ್ಯಾಗಾರದಲ್ಲಿ ಕಂಡುಬಂದಿದೆ.

ಉತ್ಪತ್ತಿಯಾಗುವ ಸುಮಾರು ೮೦% ಮಣಿಗಳು ೧೫ ಮಿ.ಮೀ ಗಿಂತ ಕಡಿಮೆ ಗಾತ್ರವನ್ನು ಹೊಂದಿರುತ್ತವೆ ಮತ್ತು ಉಳಿದ ೨೦% ಮಣಿಗಳ ಗಾತ್ರ ೧೫ ರಿಂದ ೨೫ ಮಿ.ಮೀ ಆಗಿರುತ್ತದೆ.

ಆದ್ದರಿಂದ, ೧೦೦ W ಎಸಿ ಮೋಟರ್‌ನಿಂದ ಚಲಿಸುವ ಹೊಸ ವಿನ್ಯಾಸದ ತುಳಸಿ ಮಾಲೆ ಮಣಿಗಳನ್ನು ತಯಾರಿಸುವ ಯಂತ್ರವನ್ನು ಅಭಿವೃದ್ಧಿಪಡಿಸಲಾಗಿದೆ. ೨೫ ಮಿ.ಮೀ ಗಾತ್ರದ ಮಣಿಯನ್ನು ಕತ್ತರಿಸಲು ಯಂತ್ರವನ್ನು ಯಶಸ್ವಿಯಾಗಿ ಪರೀಕ್ಷಿಸಲಾಗಿದೆ. ಸುಗಮ ಅನುಭವಕ್ಕಾಗಿ ಲೀನಿಯರ್ ಬೇರಿಂಗ್ ಗೈಡ್ ರೈಲನ್ನು ಉಪಯೋಗಿಸಲಾಗಿದೆ. ಇದು ಕಂಪನ ಹಾಗೂ ಧ್ವನಿಯನ್ನು ಹೀರಿಕೊಳ್ಳುತ್ತದೆ.

ತುಳಸಿ ಕಾಂಡವನ್ನು ಧೃಢವಾಗಿ ಹಿಡಿಯಲು ಸ್ಪ್ರಿಂಗ್ ಅನ್ನು ಮರುವಿನ್ಯಾಸಗೊಳಿಸಲಾಗಿದೆ. ಮಣಿಗಳಲ್ಲಿ ರಂಧ್ರಗಳನ್ನು ಮಾಡಲು ಸಾಂಪ್ರದಾಯಿಕವಾಗಿ ಉಪಯೋಗಿಸುತ್ತಿದ್ದ ಪಿನ್ ಅನ್ನು ಮಾರುಕಟ್ಟೆಯಲ್ಲಿ ಸಿಗುವ ೧.೫ ಮಿ.ಮೀ ಡ್ರಿಲ್ ಬಿಟ್ ನಿಂದ ಬದಲಾಯಿಸಲಾಗಿದೆ. ಕಾರ್ಯಾಚರಣೆಯ ಸಮಯದಲ್ಲಿ ಬಿಸಿಯಾಗುವ ಮೋಟರ್‌ನೊಂದಿಗೆ ಕೈಯ ಸಂಪರ್ಕ ತಪ್ಪಿಸಲು ಮರದ ಕೈ ವಿಶ್ರಾಂತಿಯನ್ನು ಅಳವಡಿಸಲಾಗಿದೆ. ಸಾಧನವನ್ನು ಚಿಕ್ಕ ಹಾಗೂ ಸಾಗಿಸಲು ಅನುಕೂಲವಾಗುವಂತೆ ಮಾಡಲಾಗಿದೆ. ಸಾಧನವನ್ನು ಮಧುರಾ, ಯು.ಪಿ. ಯ ಜೈತ್ ಗ್ರಾಮದಲ್ಲಿ ಪರೀಕ್ಷಿಸಲಾಗಿದೆ ಮತ್ತು ಬಳಕೆದಾರರ ಪ್ರತಿಕ್ರಿಯೆಯ ಪ್ರಕಾರ ಅನೇಕ ಮಾರ್ಪಾಡುಗಳ ಮೂಲಕ ಸಾಗಿದೆ. ಪರೀಕ್ಷೆಯ ಸಮಯದಲ್ಲಿ ಅವಲೋಕನಗಳ ಪ್ರಕಾರ, ಬಳಕೆದಾರರು ಹೊಸ ಯಂತ್ರವನ್ನು ನಿರ್ವಹಿಸಲು ೫ ನಿಮಿಷಗಳಲ್ಲಿ ಕಲಿತಿದ್ದಾರೆ. ಈ ಯಂತ್ರವನ್ನು ಐಬಿಟಿ ದೆಹಲಿಯ ೨೦೧೯ ಇಂಡಸ್ಟ್ರಿ ಡೇ ಹಾಗೂ ಟೆಕ್ 4 ಸೇವಾ ಕಾರ್ಯಾಗಾರದಲ್ಲಿ ಪ್ರದರ್ಶಿಸಲಾಗಿದೆ.

Suraj Bhat, Research Scholar, RuTAG IIT Delhi



Figures 8(a) and (b): Tulsi mala bead making machine



तुलसी माला के मनके बनाने की मशीन

Hindi

तुलसी माला बनाना राजस्थान और उत्तर प्रदेश के क्षेत्र के कई गांवों में कारीगरों की आजीविका का मुख्य साधन है। माला के मनके बनाने की पुरानी प्रक्रिया में हस्तशिल्पियों को लगातार एक हाथ का प्रयोग उपकरण को चलाने के लिए करना होता है। इससे जल्दी थकावट महसूस होती है। झुक कर काम करने से पीठ और कमर दर्द की दिक्कत भी आती है। रुटाग आई आई टी दिल्ली ने ल्यूपिन ह्यूमन वेलफेयर एंड रिसर्च फाउंडेशन के साथ मिलकर इन समस्याओं का अध्ययन किया और एक नई मशीन को विकसित किया। यह मशीन 5 मिमी से 10 मिमी तक का मनका बना सकती है। मार्च 2018 में दिल्ली हाट में आयोजित एक प्रदर्शनी में रुटाग आई आई टी दिल्ली ने तुलसी माला बनाने की इस मशीन का प्रदर्शन किया। फिर ह्यूमन सोशल वेलफेयर सोसाइटी और रुटाग आई आई टी दिल्ली ने तुलसी माला बनाने वाले कारीगरों के साथ मथुरा के जैत गाँव में एक कार्यशाला की। इसके फलस्वरूप नई मशीन निर्मित की गई जो बड़े मनके बनाने में भी सक्षम है। नई मशीन को १०० वाट की ए सी मोटर द्वारा चलाया जाता है जिसके कारण लम्बे समय तक बिना थके काम किया जा सकता है। यह मशीन 5 मिमी से 25 मिमी तक के मनके बना सकती है। इस मशीन को अपनी सुविधा अनुसार मेज अथवा फर्श पर रख कर चलाया जा सकता है। अब ह्यूमन सोशल वेलफेयर सोसाइटी इस नई मशीन का वितरण और इस पर प्रशिक्षण रुटाग, आई आई टी दिल्ली के साथ मिलकर कर रही है।

Yashwant Prasad, Project Associate, RuTAG IIT Delhi

প্রধান তদন্তকারী: ডক্টর বিনয় গুপ্তা, সহ-প্রধান তদন্তকারী: মিস্টার নুরুল হাসান লস্কর, আই.ই.সি., গ্রেটার নয়ডা, উত্তর প্রদেশ
সহযোগী বেসরকারি প্রতিষ্ঠান (NGO): ল্যুপিন হিউম্যান ওয়েলফেয়ার এন্ড রিসার্চ ফাউন্ডেশন, ভারতপুর, রাজস্থান
বাংলা অনুবাদ: সুবীর কুমার সাহা; সংশোধন: সাগ্নিক সাহা
সাধারণত বাতাসা বানাতে প্রয়োজনীয় পরিমাণে জল, চিনি, দুধ, সাইট্রিক এসিড, হাইড্রোসালফাইট ইত্যাদি মেশানো হয়। তারপর মিশ্রণটি একটা পাত্রে যেটাকে "ধওরা" বলা হয় তাতে ১০০ থেকে ১১০ ডিগ্রি সেন্টিগ্রেডে ফোটানো হয়। বর্তমান বাতাসা বানানোর এই পদ্ধতি বেশ পরিশ্রম সাধ্য এবং অস্বাস্থ্যকর। উন্নতিকরণের জন্য প্রজেক্টের প্রথম পর্বে এমন ব্যবস্থা করা হয়েছে যেটা ছবি 11(a) এবং 11(b) তে দেখানো হয়েছে। এখানে আগে পিছনে করা যায় তিনটে তাকের ব্যবস্থা করা হয়েছে। ব্যবহারকারীর সুবিধা অনুযায়ী ওগুলোর উচ্চতার পরিবর্তন করা যায়।



Figures 11 (a) and (b): Traditional method of making Batasha; and Improved structure for making Batasha

এই ব্যবস্থাতে চেয়ারে বসে আরামে বাতাসা বানানো সম্ভব। এই ব্যবস্থার দ্বারা কষ্ট ও অস্বাস্থ্যকরতার সমস্যার সমাধান করা সম্ভব হয়েছে। ব্যবহারকারীদের সুবিধার্থে যে উন্নত মিশ্রণটিকে ফোটানো হয় সেটারও উচ্চতা বাড়ানো প্রয়োজন। এছাড়া তাক দেওয়া যে টেবিলটা বানানো হয়েছে তাকে আরও মজবুত করতে হবে যেন সেটা আরো টেকসই হয়। প্রজেক্টের দ্বিতীয় পর্বে তাকগুলোকে অন্য বস্তু দিয়ে বানানোর কথাও চিন্তা করা হচ্ছে এবং টেবিল যাতে আরও মজবুত হয় তার জন্য আর কি কি ডিজাইন পরিবর্তন দরকার সেগুলো নিয়েও ভাবা হচ্ছে।

Prof. S. K. Saha, Coordinator, RuTAG IIT Delhi

ਰੂ ਟੈਗ @ ਯੂ ਐਸ ਏ

ਰੂ ਟੈਗ ਆਈ ਆਈ ਟੀ, ਦਿੱਲੀ ਦੇ ਸਹਿਯੋਗ ਨਾਲ ਪਰਡਯੂ ਯੂਨੀਵਰਸਿਟੀ ਦੇ ਈਪਿਕਸ ਪ੍ਰੋਗਰਾਮ

Punjabi

ਅਸੀਂ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਇੱਕ ਟੀਮ ਹਾਂ ਜੋ ਪਰਡਯੂ ਯੂਨੀਵਰਸਿਟੀ ਦੇ ਈਪਿਕਸ (EPICS) ਪ੍ਰੋਗਰਾਮ ਦੇ ਹਿੱਸੇ ਵਜੋਂ ਕੰਮ ਕਰ ਰਹੇ ਹਾਂ, ਫਿਲਹਾਲ ਅਸੀਂ ਇੱਕ ਬਲਦ-ਸੰਚਾਲਿਤ ਟਰੈਕਟਰ ਦਾ ਡਿਜ਼ਾਇਨ ਤਿਆਰ ਕਰਨ ਲਈ ਰੂ ਟੈਗ ਆਈ ਆਈ ਟੀ, ਦਿੱਲੀ ਨਾਲ ਮਿਲ ਕੇ ਕੰਮ ਕਰ ਰਹੇ ਹਾਂ ਜੋ ਕਿ ਭਾਰਤ ਦੇ ਪੇਂਡੂ ਕਿਸਾਨਾਂ ਦੀ ਸਹਾਇਤਾ ਕਰੇਗੀ। ਅਸੀਂ ਇਸ ਪ੍ਰਾਜੈਕਟ ਦੀ ਸ਼ੁਰੂਆਤ ਜਿੱਥੇ ਆਈ. ਆਈ. ਟੀ. ਦਿੱਲੀ ਅਤੇ ਪਰਡਯੂ ਦਰਮਿਆਨ ਮਜ਼ਬੂਤ ਸਬੰਧ ਬਣਾਉਣ ਲਈ ਕੀਤੀ ਹੈ। ਉੱਥੇ ਹੀ ਭਾਰਤ ਵਿੱਚ ਸੰਘਰਸ਼ਸ਼ੀਲ ਕਿਸਾਨਾਂ ਦੇ ਜੀਵਨ ਪੱਧਰ ਵਿੱਚ ਵੀ ਇੱਕ ਨਵੀਂ ਤਬਦੀਲੀ ਲਿਆਉਣ ਦੀ ਸ਼ੁਰੂਆਤ ਲਈ ਕੀਤੀ ਹੈ। ਰੂ ਟੈਗ ਸਮੂਹ ਨਾਲ ਸਾਂਝੇਦਾਰੀ ਕਰਕੇ ਸਾਨੂੰ ਪਤਾ ਲੱਗਿਆ ਹੈ ਕਿ ਸਾਨੂੰ ਮੌਜੂਦਾ ਬਲਦ ਨਾਲ ਚੱਲਣ ਵਾਲੇ ਟਰੈਕਟਰ ਦੇ ਡਿਜ਼ਾਇਨ ਨੂੰ ਤਿੰਨ ਮੁੱਖ ਤਰੀਕਿਆਂ ਨਾਲ ਸੁਧਾਰਨ ਦੀ ਲੋੜ ਹੈ:

- ਟਰੈਕਟਰ ਦੇ ਨਾਲ ਜੁੜੇ ਖੇਤੀ ਦੇ ਸੰਦਾਂ ਨੂੰ ਇਕਸਾਰ ਚੁੱਕਣ ਲਈ ਇੱਕ ਸਧਾਰਨ ਮਕੈਨੀਕਲ ਵਿਧੀ ਦਾ ਡਿਜ਼ਾਇਨ ਕਰਨਾ ਜੋ ਟਰੈਕਟਰ ਨੂੰ ਮੋੜਨ ਸਮੇਂ ਬਲਦ ਦੀ ਤਾਕਤ ਨੂੰ ਖਤਮ ਕੀਤੇ ਬਗੈਰ ਹੀ ਮੋੜ ਦੇਵੇਗਾ।
 - ਪਹਿਲੇ ਨੂੰ ਦੁਬਾਰਾ ਡਿਜ਼ਾਇਨ ਕਰਕੇ ਟਰੈਕਟਰ ਨੂੰ ਕਈ ਵੱਖ ਵੱਖਰੀਆਂ ਸਤਹਾਂ ਜਿਵੇਂ ਕਾਲੀ ਮਿੱਟੀ ਜਾਂ ਗਿੱਲੀ ਮਿੱਟੀ ਵਿੱਚ ਹਲ ਵਾਹੁਣ ਲਈ ਮੱਦਦਗਾਰ ਹੋਵੇਗਾ ਕਿਉਂਕਿ ਹੁਣ ਤੱਕ ਟਰੈਕਟਰ ਕਾਲੀ ਮਿੱਟੀ ਜਾਂ ਗਿੱਲੀ ਮਿੱਟੀ ਵਿੱਚ ਹਲ ਵਾਹੁਣ ਲਈ ਪੂਰੀ ਤਰ੍ਹਾਂ ਯੋਗ ਨਹੀਂ ਸਗੋਂ ਸੰਘਰਸ਼ ਕਰ ਰਿਹਾ ਹੈ।
 - ਟਰੈਕਟਰ ਦੀ ਸਮੁੱਚੀ ਏਰਗੋਨੋਮਿਕਸ ਵਿੱਚ ਸੁਧਾਰ ਕਰਨਾ ਤਾਂ ਕਿ ਲੰਬੇ ਸਮੇਂ ਦੀ ਵਰਤੋਂ ਦੌਰਾਨ ਬੈਠਣ ਦੀ ਸਥਿਤੀ ਵਿੱਚ ਸੁਧਾਰ ਹੋ ਸਕੇ।
- ਸਾਧਾਰਣ ਮਸ਼ੀਨਾਂ ਜਿਵੇਂ ਕਿ ਪੁਲੀਆਂ ਜਾਂ ਗਰਾਰੀਆਂ, ਲੀਵਰਜ਼ ਅਤੇ ਗੀਅਰ ਪ੍ਰਣਾਲੀਆਂ ਤੋਂ ਪ੍ਰੇਰਣਾ ਲੈ ਕੇ ਅਸੀਂ ਵਰਤਮਾਨ ਸਮੇਂ ਵਿੱਚ ਖੇਤੀਬਾੜੀ ਦੇ ਨਿਪੁੰਨ ਤੇ ਕੁਸ਼ਲ ਮਸ਼ੀਨਾਂ ਦੇ ਡਿਜ਼ਾਇਨ ਲੈ ਕੇ ਆ ਰਹੇ ਹਾਂ। ਅਸੀਂ ਰੂ ਟੈਗ ਸਮੂਹ ਦੀ ਸਹਾਇਤਾ, ਅਨਮੋਲ ਫੀਡਬੈਕ ਤੇ ਅਲੋਚਨਾ ਦੇ ਸਿੱਟੇ ਵਜੋਂ ਆਪਣੇ ਪ੍ਰਾਜੈਕਟ 'ਤੇ ਬਹੁਤ ਵਧੀਆ ਤਰੀਕੇ ਨਾਲ ਕੰਮ ਕਰਨ ਦੇ ਯੋਗ ਹੋਏ ਹਾਂ। ਇਸ ਸਮੇਂ ਸਾਡੀ ਟੀਮ ਨੂੰ ਰੂ ਟੈਗ ਸਮੂਹ ਦੀ ਮੁਹਾਰਤ ਤੇ ਸਹਾਇਤਾ ਮਿਲਣ ਕਰਕੇ ਉਨ੍ਹਾਂ ਵੱਲੋਂ ਕੰਮ ਕਰਨ ਦਾ ਵਧੀਆ ਸਕਾਰਾਤਮਕ ਸਹਿਯੋਗ ਰਿਹਾ ਹੈ। ਅਸੀਂ ਰੂ ਟੈਗ ਸਮੂਹ ਅਤੇ ਆਈ ਆਈ ਟੀ, ਦਿੱਲੀ ਨਾਲ ਆਪਣੇ ਰਿਸ਼ਤੇ ਨੂੰ ਜਾਰੀ ਰੱਖਣ ਲਈ ਉਤਸ਼ਾਹਿਤ ਹਾਂ ਅਤੇ ਪੂਰੇ ਭਾਰਤ ਵਿੱਚ ਸਕਾਰਾਤਮਕ ਤਬਦੀਲੀ ਲਿਆਉਣ ਲਈ ਉਤੇਜਿਤ ਹਾਂ।

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Figure 9 (Left to Right): Evan Hultman, Joshua Brody, Vivek Talapeneni, Davinder Pal Singh, Suraj Bhat, Mrigank Sharma, and Ali Brown



Figure 10: Mr. Suraj Bhat and Mr. Davinder Pal Singh with Ms. Heather Fabries (left) and Prof. William Oakes (Right)

ਸ੍ਰੀ ਮ੍ਰਿਗਾਂਕ ਸ਼ਰਮਾ, ਸ੍ਰੀਮਾਨ ਇਵਾਨ ਹੂਲਮੈਨ, ਸ੍ਰੀ ਜੇਸ਼ੁਆ ਬ੍ਰੋਡੀ, ਸ੍ਰੀ ਵਿਵੇਕ ਤਾਲਾਪੇਨੀ, ਅਤੇ ਸ੍ਰੀਮਤੀ ਅਲੀ ਬ੍ਰਾਊਨ , ਬੀ. ਈ. ਵਿਦਿਆਰਥੀ, ਪਰਡਯੂ ਯੂਨੀਵਰਸਿਟੀ, ਯੂ ਐਸ ਏ

ਰੂ ਟੈਗ ਆਈ ਆਈ ਟੀ, ਦਿੱਲੀ ਦੁਆਰਾ ਅਮਰੀਕਾ ਦੀ ਫੇਰੀ

ਆਈ ਆਈ ਟੀ, ਦਿੱਲੀ ਵਿਖੇ ਪੀ-ਐਚ. ਡੀ. ਦੇ ਵਿਦਿਆਰਥੀ ਸ੍ਰੀ ਸੁਰਜ ਭੱਟ ਨੇ 17- 20 ਅਕਤੂਬਰ, 2019 ਨੂੰ ਸੀਐਟਲ, ਡਬਲਯੂ ਏ ਵਿਖੇ ਆਯੋਜਿਤ ਆਈ ਈ ਈ ਗਲੋਬਲ ਮਾਨਵਵਾਦੀ ਟੈਕਨਾਲੋਜੀ ਕਾਨਫਰੰਸ ਵਿੱਚ “ਯਮੁਨੋਤਰੀ ਧਾਮ ਵਿੱਚ ਵਰਤੇ ਜਾਂਦੇ ਲੱਕੜ ਦੀ ਪਾਲਕੀ ਦਾ ਡਿਜ਼ਾਈਨ ਵਿਸ਼ਲੇਸ਼ਣ” ਸਿਰਲੇਖ ਵਾਲਾ ਇੱਕ ਖੋਜ-ਪੱਤਰ ਪੇਸ਼ ਕੀਤਾ। ਕਾਨਫਰੰਸ ਦੁਨੀਆਂ ਭਰ ਦੀਆਂ ਮਾਨਵਵਾਦੀ ਗਤੀਵਿਧੀਆਂ ‘ਤੇ ਕੇਂਦਰਿਤ ਸੀ ਜਿਸ ਵਿੱਚ ਸਮਾਜ ਦੀ ਬਿਹਤਰੀ ਲਈ ਵਿਕਸਿਤ ਹੋਈਆਂ ਵੱਖ-ਵੱਖ ਤਕਨੀਕਾਂ ‘ਤੇ ਪੇਸ਼ਕਾਰੀ ਕੀਤੀ ਗਈ ਸੀ। ਸ੍ਰੀ ਸੁਰਜ ਭੱਟ ਅਤੇ ਸ੍ਰੀ ਦਵਿੰਦਰ ਪਾਲ ਸਿੰਘ (ਪ੍ਰੋਜੈਕਟ ਐਸੋਸੀਏਟ, ਰੂ ਟੈ ਗ ਆਈ ਆਈ ਟੀ ਡੀ) ਨੇ 22-25 ਅਕਤੂਬਰ, 2019 ਨੂੰ ਅਮਰੀਕਾ ਦੇ ਇੰਡੀਆਨਾਪੋਲਿਸ ਦੇ ਪਰਡਯੂ ਯੂਨੀਵਰਸਿਟੀ ਵਿਖੇ ਈਪਿਕਸ (ਚਿੱਤਰ 9 ਅਤੇ 10) ਦਾ ਦੌਰਾ ਕੀਤਾ। ਈਪਿਕਸ ਪਰਡਯੂ ਪ੍ਰੋਗਰਾਮ ਵਿਸ਼ਵ-ਵਿਆਪੀ ਭਾਈਚਾਰੇ ਦੀਆਂ ਸਮੱਸਿਆਵਾਂ ਨੂੰ ਹੱਲ ਕਰਦਾ ਹੈ। ਸਤੰਬਰ 2017 ਤੋਂ ਈਪਿਕਸ ਨੇ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਰੂ ਟੈਗ ਪ੍ਰੋਗਰਾਮ ਬਾਰੇ ਜਾਣੂ ਕਰਾਇਆ ਅਤੇ ਵਿਦਿਆਰਥੀਆਂ ਦੀਆਂ ਤਿੰਨ ਵੱਖ-ਵੱਖ ਸਮੱਸਿਆਵਾਂ ਨੂੰ ਵੱਖ-ਵੱਖ ਪਰਿਪੇਖਾਂ ਵਿੱਚ ਹੱਲ ਕਰਨ ਦੀ ਕੋਸ਼ਿਸ਼ ਕੀਤੀ। ਇਸ ਦੌਰੇ ਦਾ ਉਦੇਸ਼ ਵਿਦਿਆਰਥੀਆਂ, ਸਟਾਫ਼ ਤੇ ਫੈਕਲਟੀ ਨੂੰ ਮਿਲ ਕੇ ਅਤੇ ਉਨ੍ਹਾਂ ਦੀਆਂ ਲੋਥਾਂ ਦਾ ਦੌਰਾ ਕਰਕੇ ਈਪਿਕਸ ਪ੍ਰੋਗਰਾਮ ਦਾ ਨਿੱਜੀ ਤਜਰਬਾ ਹਾਸਿਲ ਕਰਨਾ ਸੀ। ਇਸ ਦੇ ਨਾਲ ਹੀ ਪਰਡਯੂ ਯੂਨੀਵਰਸਿਟੀ ਵਿਖੇ ਈਪਿਕਸ ਅਤੇ ਸ਼ਾਹ ਗਲੋਬਲ ਇਨੋਵੇਸ਼ਨ ਲੈਬਜ਼ ਨੇ ਰੂ ਟੈਗ ਆਈ ਆਈ ਟੀ ਡੀ ਦੇ ਨਾਲ ਮਿਲ ਕੇ ਵਿਸ਼ਵਵਿਆਪੀ ਭਾਈਚਾਰੇ ਦੀਆਂ ਸਮੱਸਿਆਵਾਂ ਨੂੰ ਸਾਂਝੇ ਤੌਰ ‘ਤੇ ਹੱਲ ਕਰਨ ਲਈ ਆਪਣੀ ਇੱਛਾ ਪ੍ਰਗਟਾਈ।

Mr. Davinder Pal Singh, Project Associate, RuTAG IIT Delhi

Rural Project @NIT Durgapur

National Institute of Technology Durgapur is situated in the steel city of Durgapur which is also known as the Ruhr of India. It has the unique advantage of being acquainted with the state-of-the-art knowledge of S&T due to the presence of large and medium industries like Durgapur Steel Plant, GE Power etc. as well as the reputed research lab. like CSIR-CMERI, Durgapur. But the outskirts of the city are encircled with rural and tribal areas. The ten districts of the western and northern part of West Bengal, viz., Bankura, Bardhaman, Purulia, Birbhum, Nadia, Murshidabad, Maldah, Dinajpur, Jalpaiguri and Darjeeling; the communities of each have their own traditional life style and crafts and enterprises, mainly based on the locally available resources, like, bamboo and rice husk, handicrafts and utility products, rearing of silk worm and production of yarns and fabrics and pottery to name a few.

The people in the region, in general, are accustomed to local resource-based development and thereby raise their economy and improve their quality of life at the same time. The economy at the rural level will get a significant boost if the existing technologies of production can be improved in terms of efficiency and productivity. Recently, we have been handling projects related to Optimization of process parameters in amulet manufacturing, Study of furnaces and the process of making brass and bell metal based utensils and fishing hooks, Improvement of furnace for amulet making and working conditions of artisans, Contemporary design opportunities and business models for amulet cluster and fly-ash brick cluster.

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NIT Durgapur would like to work as a team for the development of these rural areas so that people can derive the benefits of Research and Development in various scientific fields. To address some of these issues to upgrade rural systems in terms of efficiency and productivity which will help in boosting the rural economy of the state and neighboring states like Jharkhand and Bihar.

Team NIT Durgapur are conducting regular workshops and training programs in rural clusters of the assigned district of West Bengal under Directorate of MSME sponsored project to understand their technological needs. The idea is to identify technology needs of the region, available technology solutions, problems encountered in adopting the existing technology at the grassroots, identify R&D institutions which can improve the technology, assessment of the existing technology, find out solutions to overcome the technological problems, and adapt a rural technology through R&D institutions to suit specific conditions using local resources.

Currently, a team of NIT Durgapur has encountered with the problems related to Improvement of furnace for amulet making and working conditions of the artisans, Modification of coal-based furnace and the process of making brass and bell metal based utensils, Contemporary design opportunities for amulet based fashion jewelry, Design of an LPG-fired pottery kiln for the pottery cluster, and Economic and clean manufacturing of terracotta and dokra items. In general, the major gaps identified in all these projects include lack of awareness and knowledge about available/existing solutions for a technological need. Efforts are made to make the users aware of the existing technologies, if any, or to develop low cost/efficient technical solutions as deemed appropriate.

Dr. S. S. Roy, Professor, Dept. of Mechanical Engineering, NIT Durgapur

Summer Internship by the Students of NIT Durgapur at RuTAG IIT Delhi

I, Pratik Debnath from NIT Durgapur came to know about RuTAG from the seminar I attended in my college, where Prof. S. K. Saha told us about this initiative. I have also noticed some rural problems in the surroundings of my native village, which can be solved by engineering approach. It is an engineer's job to solve these problems. I am very blessed to get this opportunity to contribute to the society as an engineering student through this internship.

Pratik Debnath, 4th Sem, Mechanical, NIT Durgapur

I am a 6th semester in the Department of Mechanical Engineering at NIT Durgapur. Currently I am doing internship at RuTAG IIT Delhi about which I came to know when Prof S. K. Saha held a seminar in our college about RuTAG. There was one line in the PPT that “let’s design for 95% population”, because all innovation taking place in this new era generally benefit only 5% of population. So, come together and let’s design for other 95% population. It should be made in India. For me, this statement is sufficient to provoke any engineer to join this great initiative. Today I am part of it as a student. I am really enjoying this internship because it demands innovation but not at the cost of its price.

Aman Kumar Rai, 6th Sem, Mechanical, NIT Durgapur

When I attended the seminar on RuTAG held at our college by Prof. S. K. Saha, I was greatly inspired by his words as he told us how the daily life problems of rural area almost get ignored and we, as engineers, should take the responsibility. I always had a thought in my mind to do something good for our people in rural areas and I just found a way to do so. I am very grateful to RuTAG team for giving me this opportunity to be a part of RuTAG internship project and I will do my best to help the team with the project.

Roshan Kumar, 4th Sem, Mechanical, NIT Durgapur

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It was a great honor to work under Prof. S. K. Saha, Prof. Sangeeta Kohli and Prof M.R Ravi who always encouraged, motivated, and helped me and have been very patient in explaining me everything. I would also like to thank the staff at RuTAG who have been very supportive and have always inspired me.

Fazil Qazi, Intern RuTAG IIT Delhi, B.E Mechanical 3rd Year student, University of Kashmir, Srinagar

Feedback and Students' perspective

I was associated with the group through the project on Batasha setup under PI and my HOD Dr. Vinay Gupta. The project was a golden opportunity for me in all respect, be it contributing directly to the need of our rural society or working with one of the finest RuTAG in the IITs or getting a chance to meet myriads of people sharing a common goal albeit with different issues/problems.

The project led us into a revelation of conditions the Batasha making people were suffering due to a traditional but poorly designed working methods. It was also a first for me to be interacting with a group of people directly for whom we have to come up with an apt process and equipment design, which instilled a sense of urgency as well as service. Weeks and months of brainstorming and after numerous design attempts, we finally came up with a 'modular multi rack table' design which satisfactorily catered to all the initial problem statements. The suggestions and guidance time to time from associated members of RuTAG helped us in achieving a modest success.

The first conference of RuTAG in March 2018 arrived just in time for us to showcase our design and take home some very critical feedback which were later incorporated in the further design. It was also a first for me, first conference as a participant.

Although the present design took a numerous testing and modifications to arrive at its present stage, it can still only be called the first step towards holistic solution to problems faced by the Batasha making people. It is good to know that even though a solution has been provided, the RuTAG is still researching upon the design for a better deliverable product.

Wishing all the best to RuTAG!

Manvendra Rai, Mechanical Engineer (2014-2018), IEC College of Engineering & Tech.

I was very fortunate that I got an opportunity to work under RuTAG for doing my internship over a period of almost two months, which proved very informative and productive for me. RuTAG helps to solve and provides the best solution to every rural problem in order to enhance their livelihood, and the innovations they make are very modernized, cheap, affordable and very easy to use that require less human efforts.

During my internship at RuTAG, I came across the problems faced by the potters of Pahari village in Bharatpur, Rajasthan in which the livelihood of large population depends upon earthen articles. I came to know that their products are selling at a very less price. I, along with Mr. Yashwant Prasad tested, observed, and analyzed the samples and aimed at increasing strength of clay articles, enhance the efficiency of their pottery kilns. I made various arrangements in conducting the field testing and arranging the devices for the field test. I have also been a part of fabricating some of the testing devices by our own rather than buying them. In this regard, I got an opportunity to visit various places, vendors and learned a lot. In regard to Tulsi Mala Bead making device, I was lucky enough to see how machine parts were manufactured. I also gave a presentation in WeLD-R which boosted my inner confidence and I learned how to deliver in front of a crowd. For me, it was a very enriching experience at RuTAG as I was doing something for easing the problems of the society.

Feedback by Fazil Qazi

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RuTAG CENTERS

IIT DELHI	rutag.iitd.ac.in
IIT KANPUR	iitk.ac.in/rutag/
IIT KHARAGPUR	http://www1.iitkgp.ac.in/nss/uba/thrust.html
IIT MADRAS	rutag.iitm.ac.in
IIT MUMBAI	www.ctara.iitb.ac.in/en/rutag/
IIT GUWAHATI	www.iitg.ac.in/mech/Rutag-pal/index1.htm
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