Report on the

Regional Workshop on Rural Technology
And visit to Binaji Barah Gaushala

by

Rural Technology Action Group (RuTAG), IIT Delhi

In Collaboration with
Shantidhara Dugdh Yojna, and Madhya Pradesh Vigyan Sabha
at
Hotel Vardaan, Indra Colony, Civil Line, Sagar, Madhya Pradesh
on
December 4, 2018

By

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Preamble

RuTAG IIT Delhi conducted a regional workshop on December 04, 2018 in collaboration with Shantidhara Dugdh Yojna, Binaji Bara, Sagar, M.P. and Madhya Pradesh Vigyan Sabha, Bhopal, M.P. at Hotel Vardaan, Indira Colony, Civil Line, Sagar, M.P. The program was attended by about 33 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 Coordinators of RuTAG IIT Delhi, **Prof. M. R. Ravi**, and **Prof. Sangeeta Kohli,** Professor Dept. of Mechanical Engineering, IIT Delhi and Co-coordinators RuTAG IIT Delhi, **Mr. Davinder Pal Singh,** Project Associate, RuTAG IIT Delhi, **Mr. Raj Kumar Gupta,** Sr. Project Assistant, RuTAG IIT Delhi, **Mr. Ashish,** Project Assistant, RuTAG IIT Delhi, **Mr. Amit Jain**, Shantidhara Dugdh Yojna and Sharamdaan, **Mr. Manish Kumar**, Shantidhara Dugdh Yojna and Sharamdaan, **Mr. R. R. Rahi**, Madhya Pradesh Vigyan Sabha (MPVS), and 25 other NGO participants, Institute representatives and delegates.

1. Inauguration Session (December 4, 2018)

Mr. Raj Kumar Gupta, the workshop coordinator, welcomed the delegates and participants.

1.1 Welcome address by Prof. S. K. Saha (Fig. 1)

Prof. Saha welcomed the participants and briefly explained the agenda of the workshop. He introduced the mechanism and role of RuTAG IIT Delhi in technology up-gradation for rural India. He offered his sincere thanks for the efforts of MPVS, Mr. Amit Jain and Mr. Manish Kumar in efficiently coordinating the workshop. He also thanked all the participants. This session was followed by the introduction of participants.

Fig. 1 Welcome address by Prof. S. K. Saha

1.2 Introduction of Participants

Participants from various NGOs, institutes, and organizations gave a brief introduction of themselves and their organizations (Figs. 2 and 3).

Fig. 2

Fig. 3

Figs. 2 and 3 Introduction of participants

1.3 Address by Prof. R. R. Gaur (Fig. 4)

Prof. Gaur welcomed everyone and mentioned that impacts of fast and sustainable developments have to be ascertained by understanding and choosing correct technological inputs necessary for the growth. He mentioned that it is essential for a scientific institute to provide proper technical solutions which would be environmental and user-friendly. He also emphasized the link between IIT and NGOs for the betterment of rural livelihood. He added the need for sustainable existence of the community. He discussed the role of RuTAG and challenges in rural technology development and dissemination.

Fig. 4 Address by Prof. R. R. Gaur

2. Technical Session-1

2.1 Presentation on Rural Technologies developed under RuTAG IIT Delhi by Prof. S. K. Saha (Fig. 5)

Prof. S. K. Saha outlined several completed and on-going projects of RuTAG IIT Delhi. He gave a brief explanation on Animal Driven Gear Box, Bullock Driven Tractor (old and new), Treadle Pump, Tulsi Mala making Device, Sheep Hair Shearing Device, Ground water measuring device and Carpet related machines developed by IIT Delhi. He also mentioned the objectives and mandate of the RuTAG programme.

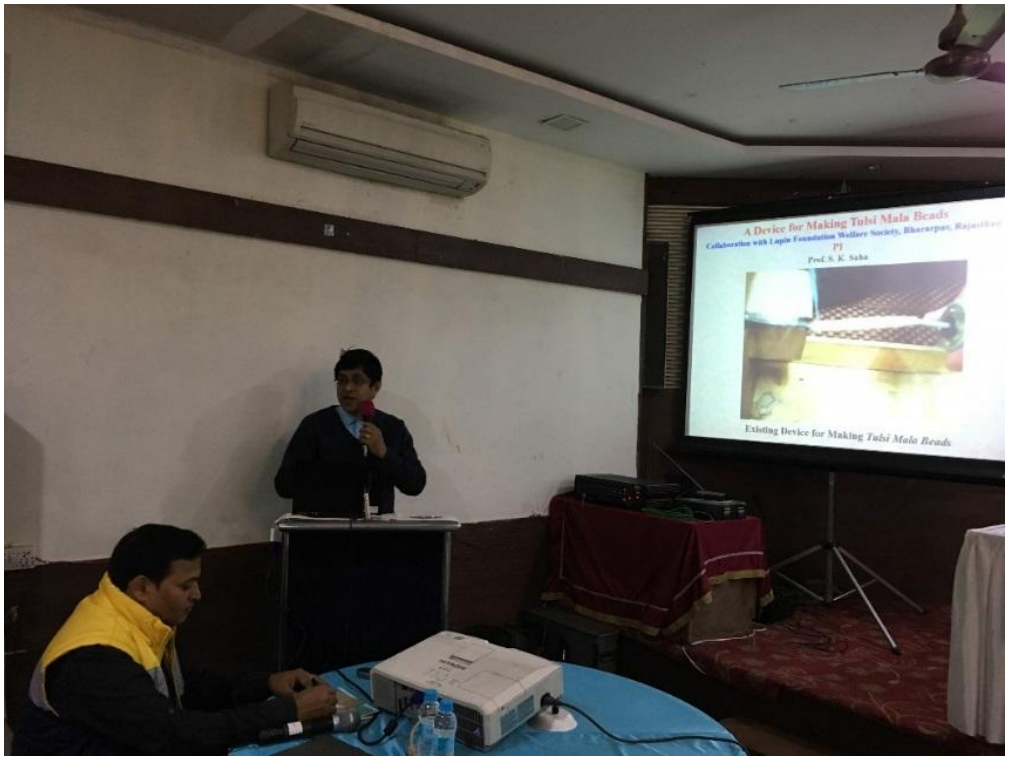

Fig. 5 Presentation by Prof. S. K. Saha

2.2 Presentation by Mr. Amit Jain and Mr. Manish Kumar, Shantidhara Dugdh Yojna, Binaji Barah, Sagar, M. P. (Fig. 6)

Mr. Amit Jain told that he was inspired by the Saint Shree Vidyasagar Ji to join Shramdan while he was working with Deloitte in the USA. He left USA and job to fulfill his master's wish. Currently, 30 persons which include CA's, MBA's, and Engineers are part of his team working in various districts in MP and nearby states. He and his team took a special interest in handloom cluster development. In 2015, 14 people received handloom training for an acquaintance of the trade and started handloom training centres in Sagar and Damoh districts of MP and five centres in other states. Presently, they have around 35 persons to handle various departmental activities such as raw materials, design inputs, production planning, quality and inspection, value addition and marketing. They have started retail outlets in Bhopal and recently opened a retail store in Khajuraho made of bamboo structure. Their training program provides a stipend of 300/day. Till today, they have trained 90 persons with various handloom activities. They are also manufacturing and selling handlooms and sold around 1000 units. They also want to collaborate with IIT Delhi to boost the livelihood of the people at the grassroots. He also mentioned about the RuTAG technologies which are

procured by his team such as Animal Driven Gear Box (ADGB), Tulsi Mala Making Device, Treadle Pump, and Bullock Driven Tractor (BDT), etc.

Mr. Manish told that before joining Shantidhara, he was working with Maruti Suzuki, India. Later, he received training for cattle breeding. Currently, he is operating a cattle farm comprising 450 cows spread over 121 acres in Binaji Barah in Sagar district. They have introduced various Ayurvedic medicines made of cow excreta, setup biogas plant and have adapted organic farming for cultivation. They have also introduced various machinery and equipment to make cow and cattle useful.

Fig. 6 Presentation by Mr. Amit Jain and Mr. Manish Kumar

2.3 Presentation by Prof. M. R. Ravi on furnaces developed by IIT Delhi (Fig. 7)

Prof. M. R. Ravi introduced participants with his work on various kinds of furnaces which he improved and implemented in various villages of India. He explained improvisations undertaken in Bangles making Furnace at Bharatpur which lead to 70% fuel savings. He also mentioned the success of updraft potters kiln made using rat trap bonds in brick masonry introduced to the potter's cluster of Kondagaon in Chattisgarh. This saved around 40% of fuel, and same technology has been introduced in a project funded by NBCFDC for the construction of potter's kiln in Khurrampur village near Gurugram. He also highlighted Bell Metal Furnace which was modified using LPG as a fuel instead of coal and wood. The changes saved half of the fuel cost.

Fig. 7 Presentation by Prof. M. R. Ravi

2.4 Discussion on RuTAG Technologies

Prof. Ravi's presentation was followed by the discussion in which the participants asked questions about the RuTAG technologies and their adaptation. Prof. R. R. Gaur, Prof. Saha, and Prof. Ravi gave their views and opinions on the queries of the participants.

3. Technical Session-2: Interaction and Presentations

3.1 Madhya Pradesh Vigyan Sabha, Bhopal, Mr. R. R. Rahi

Mr. Rahi acknowledged the successful working of Bullock Driven Tractor and Treadle pump given by RuTAG IIT Delhi for demonstration and training purpose in Tamia, M.P. He presented Non-Timber Forest Produce (NTFP) based alternative livelihood. A technology package developed by MPVS containing:

- Bael products such as squash, drinks, etc.,
- Corn cookies, rusk, etc.
- Mahua fruit products such as biscuits, cakes, bread, etc.
- Minor Millets cookies, etc.
- Scientific extraction of honey from the comb, its processing, and packaging unit, etc.
- Oil extraction, especially non-edible oils.
- Grinding of Turmeric.
- Plucking of fruits.

IIT Delhi Remarks

- Chairman appraised the work of MPVS and stated some significant steps in further collaboration with MPVS.

3.2 Wainganga Samudaik Vikas Kendra Dhapewada, Kumhari, Balaghat, M. P., Mr. A. K. Charles

Mr. Charles acknowledged the successful working of BDT and Treadle pump given by RuTAG IIT Delhi for demonstration and training purpose for villagers in Balaghat. He suggested few technologies for replacing plastic pots with earthenware and pots made of biodegradable paste. He wanted intervention in the following:

- Design of bio-degradable flowerpot for bio composting.

IIT Delhi Remarks

- The bio-degradable flowerpot technology is available at Dr. Girdhar Mathankar, Sanjeevan Samiti Shahdol, the contact details of Dr. Girdhar will be provided to Mr. Charles**.**

3.3 Sanjeevan Samiti Shahdol, M. P., Dr. Girdhar Mathankar

Dr. Gridhar told that Sanjeevan started 18 years ago and is working with 1300 Self Help Groups. He highlighted the project for installation of 1200 solar lanterns in rural area of

Shahdol. He mentioned that there is a need to increase the farmer production with less input. He wanted interventions in the following:

- Training for tulsi mala machine
- Establishment of a technology park for rural technologies
- Need of BDT for demonstration
- Improvement in potter's kiln at Shahdol
- Policy for the dissemination of technology
- Solar dryer for vegetables

IIT Delhi remarks

- More details will be required to set up the demonstration centre of RuTAG technologies such as Tulsi Mala Making Device and Bullock Driven Tractor, etc. at Sanjeevan Samiti. NGO was suggested to send proper details about the utilization of the technology and provide date and venue for the demonstration of RuTAG technologies.

3.4 Paryavaran Shiksha Evam Sanrakshan Samiti Bhopal, M. P., Mr. Dharmendra Chowdhary

Mr. Dharmendra Chowdhary presented the vast area of work of his organization. They are as follows:

- Dairy farming
- Organic farming
- Bee farming
- Bamboo craft
- Low cost technology development for the rural area
- Eco-friendly technology
- Video production
- Hydroponics production of fodder for cattle in 800 sq feet (400kg of fodder/day)

Intervention required for following:

- Perfume (Ittar) manufacturing.
- Stray animal use for power generation
- Process for manufacturing of tablets for nutrients
- Distillation of cow urine
- Waste management
- Drying of waste material

IIT Delhi remarks

Prof. Gaur mentioned the NGO to be specific about the problem. He asked the NGO to send the details of the specific problem with details to RuTAG IIT Delhi. A RuTAG IIT Delhi technology - Animal Driven Prime Mover (ADPM) was suggested to the NGO for the utilization of stray animal such as cows/cattle. Contact details of Mr. Manish and Mr. Amit from Sharamdaan and Shantidhara Dugdh Yojna, Binaji Barah, Sagar will be provided to Mr. Dharmendra.

3.5 G. V. P. S. Bhailur, Balaghat, M. P., Mr. Umakant

Area of work of his organization

- Organic farming with minimum input
- Vermicomposting technology which is saving nearly Rs. 50000 per year

Intervention required

- Wetness in Vermicomposting
- Drier for seed
- Solar fan for seed treatment in large scale

IIT Delhi remarks

- Prof. Gaur suggested the NGO about the existing solar dryer technology such as Solar Tunnel Dryer by Focusun Energy Systems, Coimbatore, etc. that are commercially available in the market.

3.6 Janjagriti Siksha Kendra, Seharo, Jabalpur, M. P., Mrs. Rekha Rajput

Area of work of her organization

- Working with 500 SHG's

Intervention required

- Seed manufacturing/marketing/packaging
- Providing training for organic farming

IIT Delhi remarks

- Specific requirement is required without which no real work can be started by RuTAG IIT Delhi. Hence, the NGO is requested to provide atleast one specific need to RuTAG IIT Delhi within a month.
- The problems raised by the NGO were related to agriculture, therefore, NGO was suggested to contact Agricultural Technology Institutes such as Indian Agricultural Research Institute (IARI), Delhi.

3.7 Nav Prayas Mahila Samiti Sagar, M.P., Mr. Hemant Azad

Intervention required

- Need technology for the bell metal cluster in Tikamgarh.
- Need technology for handloom clusters in Bundelkhand.

IIT Delhi remarks:

- The NGO must list the exact technology needed. RuTAG office can be contacted for the clarification.
- Prof. Ravi from IIT Delhi will help regarding technological interventions required in furnaces.

- Mr. Amit Jain of Shramdaan Training Centre will help regarding technology interventions for handloom.

3.8 Gujarati Samaj Sewa Sansthan Moraina, M. P., Mr. Zakir Hussain

Mr. Hussain told that Moraina District is known for the cultivation of Guggal plantation. Gum from the plant is being sold at Rs. 1000/kg and seeds of the plants are sold at Rs. 10,000/ kg. It has appalling scope by the survival rate of the plant is only 10%.

Intervention required

- The mechanism/hand tool for slicing the Guggul tree for extracting gum.
- Civil construction technology required to stop fissures.

IIT Delhi remarks:

- Appears to be an interesting problem.
- Photographs and videos about the mechanism will be sought from the NGO for further understanding of the problem.
- Similar technology has been found by RuTAG IIT Delhi team which is being researchized by ASPEE College of Horticulture and Forestry, Gujrat. Contact details of the college will be provided to the NGO.
- Dr. Susha Lekshmi from RuTAG IIT Delhi will assist in providing solution related to fissures problem.

4. Concluding Session

Prof. R. R. Gaur conducted the concluding session. He invited Prof. S. K. Saha, Prof. M. R. Ravi, Prof. Sangeeta Kohli, Mr. Amit Jain, Mr. Manish Kumar, and Mr. R. R. Rahi for their comments. Prof. Gaur thanked all the participants for their effort in making this workshop a success. He emphasized the RuTAG workshop and its outcomes. He asserted on the future steps that will be taken up on the problems pointed out during the sessions. Mr. Amit Jain thanked RuTAG IIT Delhi for conducting the workshop in Sagar, M.P. He appreciated RuTAG's participation in betterment of the rural areas. He mentioned that Shantidhara Dugdh Yojna, Binaji Barah will be collaborating with RuTAG IIT Delhi in future for improving the technologies required. He also appreciated the initiative taken by RuTAG to increase the student involvement in solving and understanding rural problems.

5. Vote of thanks delivered by Mr. Raj Kumar Gupta, Sr. Project Assistant, RuTAG IIT Delhi.

6. Visit to Shantidhara Dugdh Yojna (Figs. 8and 9) and Sharamdaan (Hathkardha) Training Centre (Figs. 10 and 11)

Next day (on December 5, 2018), RuTAG IITD team along with 7 NGOs/Workshop participants visited Shantidhara Dugdh Yojna (Gaushala) under the guidance of Mr. Amit Jain. Mr. Jain gave a brief speech on the foundation of Shantidhara. He stated that it has 121 acres of land and 450 cows. He explained how they utilise the cow dung by making vermi-compost fertiliser and bio-gas. He also asserted the use of cow urine to make medicines.

Fig. 8 From left to right: Mr. Manish Kumar; Prof. S. K. Saha; Prof. R. R. Gaur; and Mr. Amit Jain at Shantidhara Dugdh Yojna

Fig. 9 Prof. Saha and other participants visiting vermi compost shed at Shantidhara

Fig. 10 RuTAG IIT Delhi team and workshop participants at Hathkardha Training Centre

Fig. 11 Weavers working on handlooms at Hathkardha Training Centre

They have a sales portal in M.P. only till now but he said they will be opening other outlets outside M.P. too. All the participants then visited Hathkardha Training Centre where Mr. Jain and his colleagues train weavers, providing them a good stipend and a better lifestyle. He mentioned that they have 4-5 training centres in M. P. Various products have been manufactured and sold at these centres including handlooms, towels, kurtas, sarees, etc.

RuTAG IIT Delhi team and the NGOs interacted with the workers of Sharamdaan (Hathkardha) and listened to their experiences at the training centre. Before leaving, all visited nearby Digambar Jain Temple to seek blessings of the God. At the end of the day, Prof. Saha thanked everyone for participating in the workshop.

7. Acknowledgement

This report is compiled by Mr. Davinder Pal Singh and Mr. Ashish. The PI thanks them.

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