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Headquarters
Dte General Border Roads
Seema Sadak Bhawan
Ring Road, Delhi Cantt
New Delhi-10

67859/Gen Policy/DGBR/ 161 /E3ES 02 Dec 2014

HQ CE(P)
C/O 56/99 APO

AMENDMENT TO BRDB LETTER TO AUTHORISE CHIEF ENGINEER PROJECTS TO PROCURE LOOSE BB/BSB COMPONENTS UNDER CE's POWERS AS PER GROUND REQUIREMENT

1. Photo copy of Sectt BRDB letter No BRDB/04/696/BB Comp/2014/WKs dated 20 Nov 2014, on the above subject is forwarded herewith for your information and further necessary action.

2. It is further added that procurement action for loose Bailey Bridge components as mentioned in the Appendix "A" has already been initiated by this Dte which is at advance stage. The remaining loose BB/BSB components may please be procured at project level under delegated powers of Chief Engineer Projects as per their ground requirement.

3. Please ack receipt.

(Rahul Rathee)
AEE(E&M)
Asst Dir/E3ES
For Dir Gen Border Roads

Encls : As above

Copy to :-

DGBR/TP Dte -

1. For info alongwith a copy of Sectt BRDB letter referred at para 1 above.

2. It is intimated that the procurement action for loose BB components as reflected in the enclosed Appendix "A" has already been initiated against the requirement given vide your Sec Note No 22351/BB/DGBR/116/TP(Res) dated 27 Jun 2014.

3. For info & necessary action at your end, please.

F.No. BRDB/04/696/BB Comp/2014/Wks

Government of India
Ministry of Road Transport and Highways
Border Roads Development Board

4th Floor 'B' Wing,
Sena Bhawan,
New Delhi-110011

Dated: 20th Nov, 2014

The Director General Border Roads
Seema Sadak Bhawan, Ring Road Delhi Cantt,
New Delhi-110010

Sub :**Amendment to BRDB letter to authorize Chief Engineer Projects to Procure loose BB Components under CE's powers as per ground requirement**

Sir,

In partial modification of BRDB letter No. F.157 (7)/BRDB/S-85-III dated 16th December 1991, the following amendments have been approved by the competent authority:-

FOR

Para 2 : "I am also directed to say that the Equipment bridging shall be centrally provisioned by Director General Border Roads on the basis of projections made by Chief Engineers of various projects".

READ

Para 2 : "I am also directed to say that the complete Equipment bridging sets *complete* shall be centrally provisioned by Director General Border Roads on the basis of projections made by Chief Engineers of various projects, however *Chief Engineer Projects can procure loose BB/BSB components under CE's delegated powers as per ground requirement*".

2. All other entries of this Secretariat ibid letter remain un changed.

3. This issues with the concurrence of Min. of Def (Fin/BR) vide their 19(3)/2002/BRS (328/BRS/14) dated 14.10.2014.

Yours faithfully,

(Rampal Singh)
Under Secretary to the Govt. of India

Copy to :-

1. Min of Def (Fin/BR)
2. CGDA, New Delhi
3. DGADS, New Delhi
4. PCDA (BR), New Delhi
5. IFA (BR), New Delhi

डा. आर. चिदम्बरम्
भारत सरकार के प्रमुख वैज्ञानिक सलाहकार
एवम्
डी.ए.ई. - होमी भाभा प्रोफेसर
Dr. R. Chidambaram
Principal Scientific Adviser to the Govt. of India
&
DAE - Homi Bhabha Professor

सत्यमेव जयते

विज्ञान भवन एनेक्सी
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rajachid@nic.in

Prn.SA/19(C-1)/2014
Dated 23rd July, 2014

Sub: Technology Development and Delivery for Rural Uttarakhand

Dear Shri Narendra Modiji,

Last week I inaugurated a '**mountain foot bridge**', developed by R&DEngineers, a premier laboratory of DRDO, at HESCO gaon Shuklapur near Dehradun; its picture is shown in Annexure 1.The bridge is an adaptation of the 35-metre span man-portable 'Mountain Foot Bridge' developed by R&DE for the armed forces for use in inaccessible high altitude regions.

After the Uttarkhand disaster in June 2013, during a visit to Pune where I inaugurated a 'Robotics' Conference, myself and SA to RM Dr. Avinash Chander were shown this bridge. I asked the Director Dr. Guru Prasad whether this technology can be used to restore the disturbed mobility logistics in Uttarakhand, where, according to Dr. Anil Joshi, founder Chairman of HESCO(Himalayan Environmental Studies and Conservation Organization, with whom our Office has executed several projects), more than 700 bridges were destroyed during the disaster. Dr. Guru Prasad and Dr. Avinash Chander said that this is indeed possible and readily agreed to donate a demonstration bridge to a village Takshila about 15 km from Dehradun). Dr. Joshi thereafter visited the R&DE labs in Pune.

DRDO designed the low-cost (using steel instead of high strength aluminium alloy used in the military bridge) 13.5 m span (folding, portable) mountain foot-bridge with a 1.5 m pathway, which is deployable in 2 to 3 hours and its launch does not require access to far-bank or elaborate site preparations. The bridge is designed to meet the specific needs of the people of the Himalayan region.

This is an example of the use of a high technology product, developed by one of our scientific organizations with one objective, being used for another purpose with suitable innovations.

Contd. Page 2/-

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E-mail : rc@barc.gov.in Website : www.psa.gov.in

DRDO is also willing to transfer the technology to local entrepreneurs and run a Training Workshop for them. The scaling of this innovative bridge, costing about Rs. 6.5 Lakh each, to hundreds needed in other locations in Uttarakhand would require the financial support of the State/Central Government.

I have always said; " *India's technology needs range from nuclear to rural...I will consider India a 'developed' country in the fullest sense of the term when the quality of life in rural India becomes comparable to the quality of life in the non-urban areas of already developed countries.* "

One of the areas of focus of my Office is related to the development, delivery and dissemination of technologies for rural development. We work with voluntary organizations led by scientists or which have a strong scientific component. I had started in 2003 this *RuTAG* (Rural Technology Action Group) programme, which is an open platform innovation strategy (what is needed in mountainous regions is different from what are needed in the plains and the coastal regions) and is currently centred in seven IITs, including IIT Roorkee. I have enclosed an article entitled "The Importance of Rural Technology Delivery" by me and my colleague S.Chatterjee, published last year, as Annexure 2.

Among the important initiatives of RuTAG described there are two in Uttarakhand: the 'recharging of acquifers in hilly regions'(with the help of BARC) and 'gravity-based ropeways' for transfer of perishable products from the producers in higher hilly regions to the lower region markets (designed by IIT Roorkee).

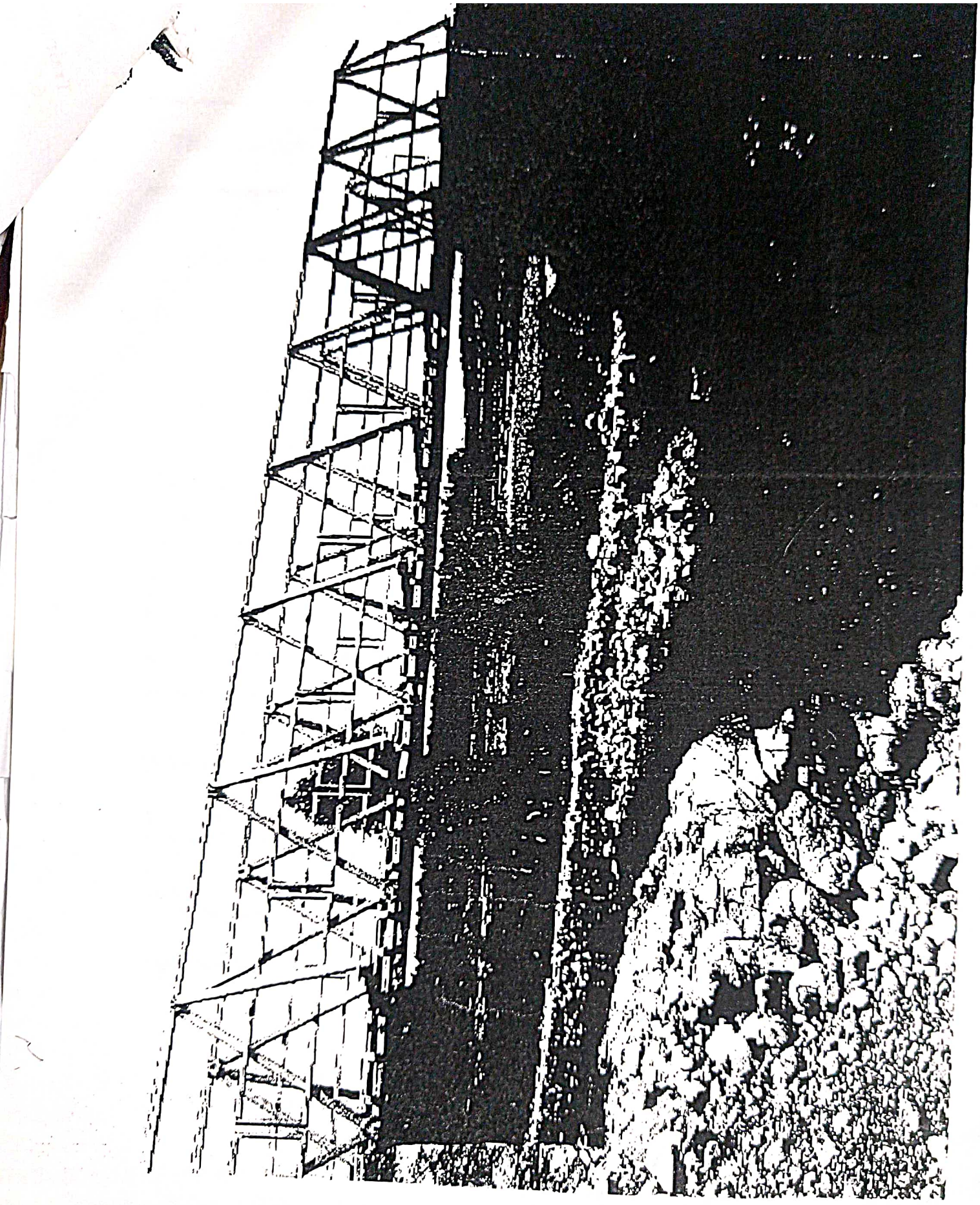
hilly -like regions

Yours sincerely,

R. Chidambaram

(R. Chidambaram)

Shri Narendra Modi
Hon'ble Prime Minister of India
Prime Minister's Office
South Block, New Delhi



J FAX 23702004 DIRACTOR BRDB 2010
Annexure 2.

The Importance of Rural Technology Delivery

Dr. R. Chidambaram
Principal Scientific Adviser to the Government of India.

S. Chatterjee
Scientific Consultant
Office of the Principal Scientific Adviser to the Government of India.

Prologue

'Inclusive Growth' is one of the prime focus areas engaging the attention of our planners and decision-makers.

In this inclsive Paper, Dr. R. Chidambaram, Principal Scientific Adviser to Government of India, (and the co-Author), emphasizes the importance of availability of natural resources locally for ensuring effective rural industrialization. Such material could be gathered from nature or cultivated to which value should be added for the benefit of the rural population, especially the weaker section. They have given a number of success stories in which rural technologies have been effectively used for upliftment of the populace.

Dr. Chidambaram and the co-Author reiterate the importance of the strategy of undertaking rural industrialization based on value addition to rural natural resources for ensuring inclusive growth.

A very thought-provoking Article and a must read for all.

– Editor

Introduction

Around 70% of the rural population is engaged in agriculture (or allied activity) which, however, contributes only around 28% to GDP. There has been significant infusion of technology in the agricultural sector but, for a variety of reasons, mostly systemic, the development in agriculture has not contributed to "Inclusive Growth" and rural poverty remains a matter of serious concern. Other important sectors such as health, education, rural industries (essentially non-farm), etc., which can contribute to "inclusive growth", have unfortunately not had the full benefit of latest scientific and

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Introduction

Around 70% of the rural population is engaged in agriculture (or allied activity) which, however, contributes only around 28% to GDP. There has been significant infusion of technology in the agricultural sector but, for a variety of reasons, mostly systemic, the development in agriculture has not contributed to "Inclusive Growth" and rural poverty remains a matter of serious concern. Other important sectors such as health, education, rural industries (essentially non-farm), etc., which can contribute to "inclusive growth", have unfortunately not had the full benefit of latest scientific and

technological inputs for accelerating the development of rural areas, primarily due to a weak and unorganized system of technology delivery.

Importance of Rural Non-farm Sector

It has been widely noted that development of the rural non-farm sector, i.e. rural industries and a variety of related and other services, is vital for the creation of employment in rural areas at a juncture when agricultural employment has little scope for expansion, and employment in urban areas is also not likely to expand so rapidly as to absorb people from rural areas, more so when newer modern industries tend not to be employment-intensive. Rural industrialization offers a means by which to add value to production within rural areas themselves, not only to generate rural employment and incomes, but also to redress the adverse terms of trade between (rural) agriculture and (mostly urban) industry and increase the contribution of rural areas to the GDP by increasing their share within the industrial sector. The rural non-farm and service sectors are in urgent need of technology infusion that would enable the rural people to add optimal value to available primary resource, establish market linkages and increase their disposable income to make a tangible contribution to the national economy. This process alone has the prospect of inclusive growth for rural India.

Rural Technology Delivery - A Few Issues

In the chain: ***Research- Development – Delivery***, while 'industrial development' requires creation of innovative academia – industry interfaces to strengthen the middle 'development' part, for 'rural development' the emphasis has to be on **"Effective Rural Technology Delivery"**. Most of the knowledge needed for rural development already exists and new knowledge can be added, but the most important issue is to develop innovative mechanisms of rural technology delivery.

The issue of efficient rural technology delivery has been widely discussed over the years at various levels in Government, Research Institutions, Universities, and also among voluntary organizations. Other important issues that closely relate to the problems of technology transfer in rural areas, such as lack of field-tested and validated models; inadequate institutional support both for technology development and transfer; lack of flexibility in Governmental mechanism; etc., have also been discussed and documented.

Experience with much of past technology infusion attempts has shown that often technologies developed in laboratories, but not tested and proven under field conditions, were disseminated on a large scale with naturally, poor results. The reasons for this include non-acceptance by intended beneficiaries, under-performance and unsuitability for rural conditions. Examples of successes, and more importantly of failure, have been poorly documented and inadequately shared among stakeholders leading to unnecessary repetition, infructuous expenditure and considerable de-motivation among both technology providers and users. On the other hand, rich and

valuable experience has also been gained with some systematic and participatory need-based technology generation, pilot field projects to examine performance and viability, demonstration projects to assess suitability for different field conditions, and finally effective technology dissemination with appropriate institutional linkages for technology development and infusion, training, technical back-up, managerial support and other hand-holding services. There are also a few, albeit rare, examples of inter-agency collaboration in rural technology infusion that have effectively synergised the agencies' respective strengths and demonstrated the enormous impact possible from such effective co-ordinated exercises.

Technologies relevant for rural industries in particular and rural development in general require to be competitive, to have high productivity, to produce quality products, and reduce or eliminate drudgery, and yet generate maximum possible employment. These goals are not mutually incompatible at all, as several successful models have demonstrated, but represent the real challenge of R&D for rural application.

Rural Technology Action Group (RuTAG)- A new initiative

The Office of the Principal Scientific Adviser (PSA) to the Government of India has been implementing a programme from 2003, which aims to improve the process of Rural Technology Delivery.While there are a number of important initiatives in various departments, e.g. DST (Department of Science and Technology), DBT (Department of Biotechnology), CAPART (Council for Advancement of People's Action and Rural Technology), etc., the focus of this programme entitled "Rural Technology Action Group (RuTAG)", is mostly on delivery of improved technologies accompanied with the relevant development.

The Rural Technology Action Group (RuTAG) is an open platform innovation strategy. It aims to provide a higher level of S&T intervention in rural development than what has been achieved so far. The technology delivery is mainly, though not exclusively, demand-driven. The PSA's office generally works with voluntary organisations led by scientists, or which have a large scientific component. All the RuTAG centres - seven so far- are centred in IITs; one each in Uttarakhand (IIT, Roorkee), Tamilnadu (IIT, Madras), North East (IIT, Guwahati), West Bengal (IIT, Kharagpur), Delhi (IIT, Delhi), Punjab (IIT, Ropar) and Mumbai (IIT, Mumbai). The programme also draws upon the resources of other knowledge institutions.

So far a few very interesting demonstration / catalytic projects have been carried out to popularize the technologies developed. Some examples of these projects are :

i) **Recharging of drying springs in Himalayas using isotope hydrology techniques**

The traditional water sources in Uttarakhand, such as open wells and springs are drying up because of severe deforestation and also poor maintenance of catchment areas. To ascertain as to which catchment

or water body was actually recharging the useful springs or wells within a village and find out the exact recharge characteristics and the relationship between the catchment areas and downstream wells and springs, isotope hydrology technique was used with the help of scientists of BARC. A model project was taken up in the region of Gaucher, Chamoli District, Uttarakhand. Due to this intervention, remarkable success has been achieved in which drying springs have been rejuvenated, discharges have gone up by 2-3 times and new springs have emerged. Women have benefitted enormously; they do not have to fetch water over long distances. The villagers have also taken up cultivation of vegetables as irrigation of fields is now possible. Based on the success of this experiment, ten replication projects are now under implementation in Uttarakhand and Himachal.

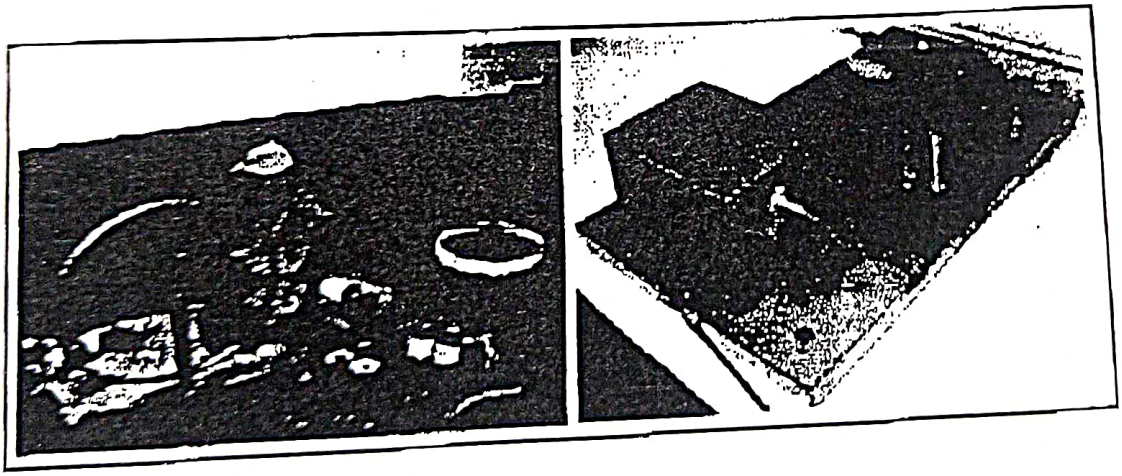
II) Development of improved system of gravity based ropeways for hilly regions of Uttarakhand

In this ropeway, designed and built by IIT Roorkee near Uttarkashi, one trolley moves up and other comes downwards by gravitational force carrying material from villages in upper reaches to road heads. The upward trolley can carry half of the weight in respect of downward trolley. The transportation cost for carrying the products from the higher reaches to the road heads has been reduced substantially. Forty quintals of produce can be transported to road head within an hour. The ropeway has become extremely popular and government of Uttarakhand has sanctioned 70 such ropeways at various locations out of which 40 have already been ~~installed~~. As suggested by us, IIT Roorkee has been asked to design all the ropeways and also entrusted with the responsibility of carrying out periodic maintenance checks.

(9)

III) Pirn Winding Machine

The existing hand operated pirn winding machine has been converted to a motorized one with additional provisions such as winding hank to bobbin, hank to pirn and bobbin to pirn. Two hundred pieces have been supplied to Co-optex. Kerala Handloom Development Corporation has placed an order for 500 machines. Enquiries have also been received from Kerala Handloom Development Corporation.



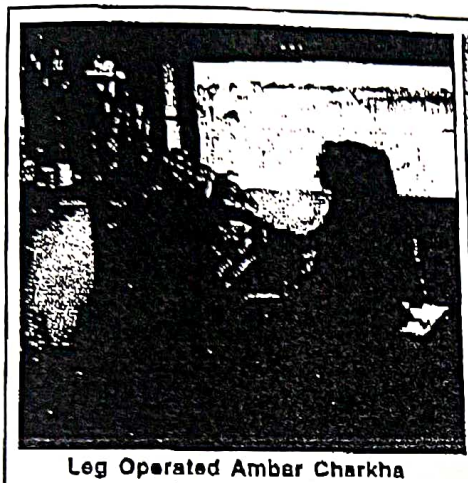
IV) Sanitary Napkins

The manufacturing facility (the original Gandhigram design was improved under RuTAG) has been set up at four places, one each in Kodaikanal, Guwahati, Uttarkashi and Balla (in Midnapur district, West Bengal). Many agencies are requesting for support to start manufacturing units in different locations.

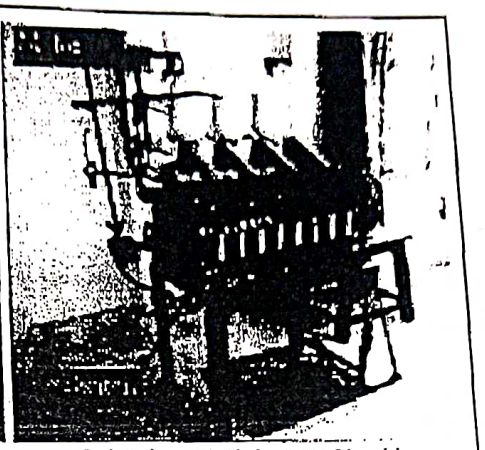
V) Improved Ambar Charkha

A hands-free Ambar Charkha has been developed which is easy to operate. The new charkha has gone through several rounds of evaluation by

KVIC who are now fully satisfied about its operational effectiveness. A workshop has been conducted to educate and train the spinners and also the manufacturers of the machine for adapting the new technology in all future charkhas.



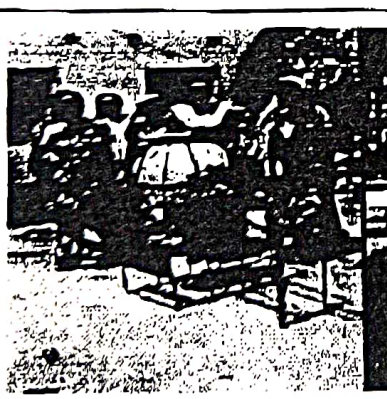
Leg Operated Ambar Charkha (acual user)



Solar Operated Ambar Cherkha

vi) Muri (Puffed Rice) Making Machine

Five machines for making puffed rice have been given to self-help groups of women and entrepreneur in West Bengal. Due to significant increase in income levels and also reduced drudgery, the machine has become extremely popular. Hundreds of such machine are in demand.



Muri Machine Installation

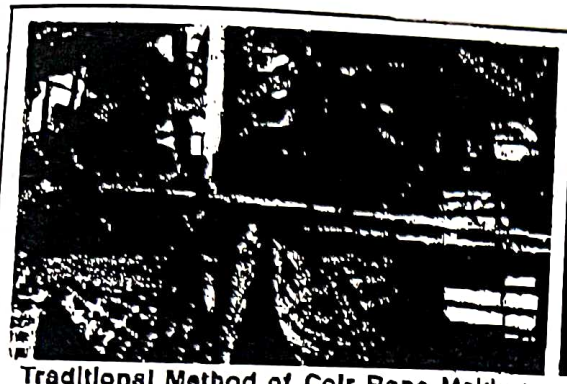
Muri Machine in Operation

Puffed Muri

vii) Design and manufacture of modernized Coir Ratt

To reduce drudgery of women in the traditional coir rope making industry, a machine has been developed at IIT, Madras which is simple to operate,

gives better quality of product and also improved output. Most importantly, a woman worker can now sit at one place and work rather that walking up and down throughout the day.



Traditional Method of Coir Rope Making

New Coir Ratt Developed

In all the above examples, the technologies are mostly biased towards use by women or are gender neutral. The efficiency in operation has removed drudgery and the additional income has significantly improved their quality of lives.

Concept Transfer and Re-Innovation

While these technologies have been very successful and popular in the places demonstrated, one has to be cautious in attempting to replicate the same models in very large numbers all over the country.

Unless it is something exceptional like 'dwarf varieties of wheat' which led to the 'Green Revolution', most rural-oriented innovations seem to be able to diffuse only to a short distance. This is unlike innovative reactor designs or branded consumer products which diffuse to long distances – the former because of the high cost of re-development and the latter because of the use of advertisement power. In the case of innovative rural technology products, the cost of technology transfer can often be more than that of re-innovation, once the concept is grasped. So, what one should be trying in rural technology development and delivery is perhaps not 'technology transfer' but 'concept transfer', followed by re-innovation.

The term 're-innovation'has been used before in the context of large scale industry products but here we are using it in the different sense of repetitive, but *suomoto*, innovation, starting from the same core concept and ending in nearly the same product. This kind of innovation seems to be inevitable in the context of rural development because of variations in raw material resource, taste, skills or even culture. In fact, it is also perhaps desirable because we can then have a large number of wealth-creating rural technology delivery centers dotted around the country.

Conclusion

The essential foundation for rural industrialization must be the natural resources available locally whether these are cultivated/husbanded or gathered from nature. These constitute the basic produce and raw material in the hands of the rural population, especially weaker sections, to which value is sought to be added. Such a strategy of local value-addition at/near the source of raw materials would also have enormous additional advantages to the national economy in reducing wastage, energy savings and obviating of unnecessary non-productive expenditures along the value chain, especially given the perishable nature of most of these commodities. It is well known that over 15% of cereals and other food grain as well as around 25% of horticultural produce are lost each year, resulting in losses running into thousands of crores, due to spoilage at different stages between harvest and retail sale. Lack of storage facilities in rural areas, spoilage during prolonged and multiple stages of transportation and warehousing are major contributors to these losses. Much of this national loss could be mitigated, with enormous concomitant benefits to both rural producers, and the national consumers, if proper preservation and processing or semi-processing are undertaken in producing areas themselves. Rural Industrialization based largely on value-addition to rural natural resources is clearly the way forward towards achieving inclusive growth.

Ackowledgements

1. Isotope Hydrology Project- Bhaba Atomic Research Centre (BARC) and Himalayan Environmental Studies and Conservation Organisation (HESCO).
2. Gravity Based Ropeway – RuTAG, IIT, Roorkee.
3. Pirn Winding Machine – RuTAG, IIT, Madras.
4. Sanitary Napkins- Gandhigram Trust, RuTAG, IIT, Madras, Kumaraguru College of Engineering, Coimbatore.
5. Improved Ambar Charkha – RuTAG, IIT, Kharagpur.
6. Puffed Rice Making Machine – RuTAG, IIT, Kharagpur.
7. Modernised Coir Ratt – RuTAG, IIT, Madras.

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