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newsletter

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★ Development Alternatives

Quarterly Newsletter
*Environmentally Sound
Appropriate Technologies*

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Technology — As if people matter

The search for human well being has led to a growing demand for models of development different from those that have thus far dominated economic and political thinking. While development must certainly create wealth, it must also directly and simultaneously enhance social justice and equity. At the same time, it has to care for environmental quality and the productivity of the resource base. And it must do so not only for everyone now, but also for the generations to come.

To achieve these complex goals, we need technologies and institutions that use resources efficiently, value systems that conserve and regenerate the environment and economic structures that promote self-reliant, endogenous choices.

It is commonly believed that the goals for sustainability cannot be achieved globally unless the principles of equity and of common, responsibilities between the North and South are respected.

The differences between the North and South are stark. Energy conservation, for example, is an everyday concern that most Europeans can address with off-the-shelf products. Villagers in many parts of India, on the other hand, still spend upto four times the amount of fuel actually needed to fire bricks for the most basic of human desires – a home. Yet a technology does exist that can produce better bricks, while drastically reducing the energy consumption and green house gas emissions at the same time. There are hundreds of such examples. New products and technologies, many with significant positive social and environmental spin-offs, are available for mass distribution. These have been the outcome of many decades of sophisticated science and technological development as also of many centuries of traditional wisdom and knowledge.

The very nature of technologies currently used in large industrial systems have put a cap to environmental sustainability and therefore to sustained economic development. Material intensities, mass movement of resources, transport energy and distribution costs are associated with such scales of manufacturing and marketing that nature cannot support.

Are there any alternatives? Sustainability on a global scale must be driven by a mix of clean and efficient production systems at all scales, including the micro and small that create jobs by the millions. Essentially, developing societies will need a large number of technology based sustainable livelihoods. Sustainable livelihoods are jobs that generate income, create goods and services for basic needs, and regenerate the environment and natural resource base. And in doing so, sustainable livelihoods will improve the quality of life of the poor in these countries.





Sustainable development must lead to a world with more equity, more ecological security, more economic efficiency, and more empowerment. And since all these are inextricably linked, this means that they must all be achieved at the same time. It is not possible to get, say, ecological security – or even economic efficiency – without greater equity and social justice. Thus, eradicating poverty is not just a moral imperative, which it certainly is, but also an ecological and social one as well. Above all the existence of extreme poverty imposes an unnecessary ceiling on the possibilities of overall development in the first place.

How do we bring about a more sustainable form of development? Technology is one of the simplest interventions available to the society, and probably the one that can be implemented most easily and quickly.

There are three broad types of impact that technology has on society. The first is its impact on the efficiency, and thus the productivity, of our economy. Technology determines how much we get for each unit of land, resources, energy, labour or other factor we put in to the production system. The second is its impact on the environment. This can be either bad, such as pollution, or good, as in regenerating soils or water systems. And the third is its impact on the distribution of wealth and equity. Technology is probably one of the biggest causes in history of the exclusion faced by certain sections of society. It has for millennia excluded the women, the poor, the villager, the farmer, and in more recent times, the whole of the South. Technology has passed all of these people by – and in the process created many perils: to the environment, to society and to the poor. These are the ultimate divides that so many international conferences these days go on about. To bridge these divides, we must now invest in a totally different future and I believe that science and technology also offers the best means to overcome those perils: a promise that can only be fulfilled if we choose and design our technologies in a very different way.

The choice of technology has to be specific to each context. It must be in tune with the people's aspirations, it must be in consonance with the resource endowments of the place, it must recognize the stage of development of a particular society or community. Furthermore, it must be accessible and scalable, and it must be environmentally friendly. As circumstances keep changing, the choice of technology must be dynamic and changing as well.

The principles of good technology are that it must liberate human potential; it must create economic opportunities; it must regenerate the resource base that we have destroyed. Gandhiji believed that technology is only good when it is servant, not the master of people. The fundamental choices that we are addressing today are, do we copycat, do we piggyback or do we leapfrog?

Copycat technologies are best avoided. The conventional automobile is an example, the internal

combustion engine is another. These are dead-end technologies. They may be here for another 20 years, may be 50 years, but you cannot imagine a world a hundred years from now where these technologies will be widespread. The same applies to large centralized production systems, such as coal-fired power stations and big factories, energy-intensive high rise buildings made of steel and cement, urban sprawl, fixed wing aircraft, I could name a hundred more. These are copycat technologies that everybody wants to get today but in fact will lead them into various dead ends, environmentally, socially and in the long run economically.

Piggyback technologies are a little bit better. They can in many cases be adapted, and perhaps will help us get from here to where we have to go. They are not necessarily permanent solutions, but can help get us through the interim phase where the immediate survival, subsistence and surplus generating needs of people can be met. These technologies include things like public transport, landline telephones, public health technologies, urban infrastructure, lighter than aircraft – airships, balloons, blimps – refrigeration, and so on. These are technologies that we have to use as a means of getting to a more sustainable world and then, in the long term, with greater efficiency.

It is, however, the leapfrog technologies that we most need to adopt. And there are two significantly different kinds of leapfrog technologies. One group consists of those that are needed by the poor, the excluded. The second group comprises those that will help everyone, included the excluded, attain his or her own human potential and growth. So, leapfrog technologies for livelihoods and basic needs are things that produce jobs and products for local markets, renewable-energy-based decentralized production systems, recycling, wireless communication (such as wireless telephones), local water harvesting structures, local construction materials, and so on.

Leapfrog Technologies - for Livelihoods and Basic Needs

- Jobs and products for local markets
- Renewable energy
- Recycling
- Wireless telephone
- Local water harvesting structures
- Local construction materials

There are certain conditions for success. I believe that technology alone cannot solve all these problems. You also have to have systems for innovation, delivery, pricing, subsidies, and so on. Equally important, reward systems must be in place to encourage scientists and engineers to work on these kinds of issues. And what we need to do now is to develop a whole new range of institutions, which can overcome the inherent contradiction between the need to fulfil social objectives and commercial viability. □



As we perceive the results of the last half a century of rural development work by voluntary agencies in India, we find that its great impact on two generations has led to the formation of several grassroots NGOs working in a large number of villages. The field of their activities varies from Khadi and village industries, tribal welfare, and basic education to the welfare of women and children. This is no mean achievement for a country like India, where the gulf between the urban elite and the rural poor is probably the widest.

The Problem

Therefore, all the planning and education that goes on for the benefit of the last man, though done with the best of intentions, is not realistic and seldom reaches the weakest.

This is because the communication between the worlds of the class and the mass is weak and the understanding of the realities of the villages by the decision-makers is poor. It is the matrix of these constructive work organizations, which have established a rapport with the rural poor that can act as a positive catalyst in providing sustainable livelihoods to the teeming millions.

Through these institutions, the use of science and technology could be pursued to bring into reality the unfulfilled dream of Gandhi. The thrust should be to empower the vulnerable half of the subcontinent that is subsisting below the poverty line, by providing them sustainable livelihoods and a life of dignity and honour.

The Approach

In order to take the benefits of S&T to the rural mud huts of our 5,70,000 villages, we will have to take the experience of the past into consideration and lay down the future plan of action, utilizing all available human and material resources. The tragedy remains that in spite of half a century of independence and the great Green Revolution, we are not able to provide more than 100 days of employment to even our farm labour. There is no work for the remaining 200 working days. Hence, the need for innovative non-farm technologies that could be turned into trades to provide livelihoods to the needy on a sustainable basis.

The Criteria

The kind of technologies that we pick up for taking to the villages should be such as will touch

the life of the poorer sections of the people first and could easily be used by them, thus bringing a ray of hope in their otherwise morbid state. Translating these technologies into trades would increase the avenues of rural employment, prevent the erosion of talents from the villages and enrich the life of the entire community, especially that of the vulnerable lot.

Positive Catalyst

All those institutions engaged in social work in the villages should take up the responsibility of introducing a number of appropriate technologies in the villages they are working in. In the choice of the technologies, they must be provided with a large range of such processes from which they may select some suitable ones that may be converted into professions to fit in with their normal activities and reduce their drudgery somewhat.

This new activity of transference of technology for the benefit of the poor will give ready results and thus bring greater confidence for the fulfillment of the noble work that is being done by the grassroots institutions. And, in the process of introducing new technologies, it is necessary that some technological institutions and scientists coordinate their efforts with the voluntary constructive work agencies. Over and above adding to the efficient functioning of the project, this will present an opportunity of interaction between the scientists and the social workers in the process of taking science to the villages.

S&T Inputs

The quantum of dissipating unemployment and hungry idle hours is so large that neither the intensive agriculture nor traditional crafts and industries can wipe them out. Over and above this, the increasing educational facility of the current type is throwing out an increasing number of educated youths at all levels, whose future is frightfully bleak. This creates situations of an impending explosion.

For applying the knowledge of science and technology, new productive occupations serving the cause of the poor, should be evolved in increasing numbers to create more and more self-employment alternatives. All our laboratories ought to be mobilized towards this. □



Vertical Shaft Brick Kiln - A Green Technology

Millions of dollars are spent in the form of grants, subsidies and loans to make this earth a cleaner place. But are the present cleaner options – easily available, more efficient, cost effective, technologically successful and most important, accepted by the society at large?

Keeping these questions in mind, a new initiative “India Brick Project” was supported by the Swiss Agency for Development and Cooperation and implemented by Development Alternatives, TERI, Gram Vikas and Damle Clay Structural Pvt. Ltd. was launched. The major stakeholders including brick entrepreneurs, policy makers and regional industry associations agree that the Vertical Shaft Brick Kiln Technology is a highly viable and appropriate solution for Indian conditions.

Policy Support

Policy support has been forthcoming from the Central Pollution Control Board (CPCB). The Central Board is preparing to issue draft notification for Emission standards and stack height regulation for the Vertical Shaft Brick Kilns. In their opinion, the Vertical Shaft Brick Kilns are energy efficient with low emission levels and do not require high stacks unlike BTKs. Most recently, the **Central Board has recommended to the state Pollution Control Board and PCCs to promote VSBK technology for brick making.**

Capital Financing

Brick industry has two profiles of entrepreneurs.

- a) The large manufactures (annual production > 40 lacs) who have high capital intensive set ups like BTKs.
- b) The medium scale manufacturers and clamp operators with annual production between 1 lakh to 20 lakh bricks / annum. They generally operate on low capital margin with negligible fixed investments.

The financing options available to medium scale entrepreneurs are indeed limited as majority of finance is needed for working capital. Banks and financing institutions shy away from providing finance as there are no tangible fixed assets and the traditional brick business is susceptible to vagaries of weather VSBK

requires almost 20 times lesser time and investment as compared to clamps and BTKs. Risk for offering credit to VSBK is further reduced as kiln itself act as permanent fixed investment and



can be used as collateral security. The pulse of increasing confidence among bankers can be easily assessed from the fact that a loan was sanctioned from ‘Oriental Bank’ Shivpuri (M.P) to a women entrepreneur in short time of just 8 days. Currently more than 6 entrepreneurs have taken loan from bank under KVIC margin money scheme.

From the point of view of banks and financial institutions, Development Alternatives is working towards achieving better technological performance with higher level of appropriate mechanization. This will benefit the entrepreneurs in terms of arranging financing for capital investments. At present, the capital expenditure is on account of mechanized lifting, lifting screw and trolley arrangement, pugging mill and brick extruder.

Production Flexibility

VSBK gives a unique flexibility in brick production where one can easily change his productivity by decreasing or increasing the operations at its shafts.

Labour Friendly

VSBK offer a conducive environment for the brick workers to work an almost smokeless and dust free environment.

With this perspective in mind DA with its sisters concern TARA is preparing a roll out plan to establish large number of kilns in coming five years in Bihar, M.P, U.P., Rajasthan, Orissa, Chattisgarh and Raipur. □

Devtoons





ENVIS Query Form

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Sustainable Livelihoods _____	_____
Environmental Pollution _____	_____

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Please mail to the attention of:

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MYTHS ABOUT HANDMADE PAPER



How is handmade paper environment-friendly ?

Handmade paper is made from non-woodpulp sources like cotton rags and other agro-residues like grass, straw, flower petals, coir and wool strands, tea leaves, etc. Moreover, in the production process of paper, there is hardly any solid or liquid effluent and all the waste is recycled.

Is it possible to write on handmade paper ?

Yes, it is possible to write on most handmade papers. The exceptions are some varieties of paper which have rough surfaces. Some varieties of art paper are especially made for painters who use water colours.

Does writing with an ink pen cause blotting ?

No, this is because all some handmade papers undergo a process called sizing that prevents blotting of ink.

Is handmade paper long-lasting ?

Handmade paper lasts much longer than any mill-made paper. This is because of its inherent strength due to the quality of cotton fibres that are physically processed without the use of chemical fibres. It is difficult to tear such a paper. This is why off late handmade paper is preferred for record books, university certificates as well as carry bags.

Is handmade paper available in smooth textures comparable to mill-made paper ?

Handmade paper can be made with smoothness comparable to mill-made paper. But, it is the fine texture that comes naturally to such a paper which has its unique charm.



FILMS ON APPROPRIATE TECHNOLOGY

Video Resource Centre at Development Alternatives

TARACRETE : A ROOF FOR THE MILLIONS

(English,Hindi / 18 min. / Rs.450)

Director : **Aparajita Gogoi**

Production Co. : **Development Alternatives**

This film is about the existing roofing gap in India and the resulting need for affordable and quality roofing material. The MCR technology and TARACrete tiles are projected as an answer to these needs. It also explains in brief the process of manufacturing TARACrete tiles and the economics of setting up an MCR enterprise selling these tiles.

BUILDING WITH MUD

(English, Hindi / 23 min./ Rs.400)

Director : **Safina Uberoi**

Production Co. : **Development Alternatives**

The film is meant for NGOs, architects, builders and people involved in exploring the possibility of mud as a

viable building material. The Balram mud block press, designed and marketed by Development Alternatives, is a simple manual device which makes easy the tedious job of mud block making. The film explains the procedure and applications of Balram.

VS BK: A TECHNOLOGY FOR THE MILLENNIUM

(English / 9.30 min. / Rs. 400/-)

Director : **Aparajita Gogoi**

Production Co. : **Development Alternatives**

Traditional methods of manufacturing bricks use one of the most polluting processes. The government in India has started its clamp down on traditional brick kilns. The search for a cleaner alternatives led Development Alternatives to the VSBK technology – a technology which enables improved fuel efficiency over existing kilns and conforms to all environmental norms. The technology, is now being disseminated in India along with multi-sectoral partners.

How clean is the Water you are Drinking? How safe is the Air you are Breathing? Check it out with TARA Pollution Testing Kits!

Pawan-TARA is a brand new portable Air Pollution Testing kit which is low on price, high on quality and can be easily operated even by school children. A timer version of the kit is also on sale.



Version I

Tests for pH and Fluoride



Two mini versions of **Jal-TARA Kit** are also available

Jal TARA is a cost effective, portable, compact and easy to operate water quality testing kit developed by Development Alternatives. Jal TARA can assess 14 essential parameters to ensure that the water is fit for drinking.

Version II

Tests for pH, Fluoride and Nitrate

For details, please contact:

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