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FOREWORD

Rural Technology Journal, a quarterly organ of Information Service Division of the C.D.R.T., I.E.R.T, Allahabad is being published since June'84. The main purpose of the Journal is to bridge the gap between the rural development planners and implementors on the one hand and the experts, scientists, technologists on the other, for the socio-economic upliftment of rural areas.

Looking towards its relevance and utility in the present developing society, we are going to publish, for the first time, an Index Issue from the very first volume with a view to provide the complete informaton about the journal to our readers/authors. At present we have taken only its first and main column i.e "PORTFOLIO", in which the Articles/Papers/Research Papers appeared. The Index is classified subject wise, under their headings. Each entry is followed by Title of the Article, Author, Month & Year (in which it appears), Subject and lastly an Abstract of the article.

We shall appreciate to receive any comments from our readers to make this Index more useful.

REPRODUCED

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ANIMAL HUSBANDRY**Management of Livestock.**

Ramaswamy N.S.

December, 1988.

A.H.

Livestock contributes almost same output value that of food grains. In addition to this, it can also uplift the rural masses by the way of increasing their income and has the potential to save huge amount of petroleum fuel used for transportation, by improving the productivity and modernising the managing system of livestock sector.

ANIMAL & HUMAN MUSCLE POWER**Human and Animal Muscle Power.**

Kapoor R.N.

June, 1986.

A.H.M.P.

The total developments in the past one decade have been more than the development that place in the past one hundred years. Yet, the crisis of energy accompanied by an employment and poverty still continues to be unabated. Due emphasis to our indigeneous requirements and resources and organizations to deal with Resarch and Development of Muscle Power may lead to solution emphasises the author in this knowledgeable article.

Effect of Old And New Bearings on Draught Requirement of Two Wheel Camel Cart.

Verma A.K. & Pratap Singh

Sept. 1992

A.H.M.P.

Investigation were carried out with the help of old (discarded from automobiles) and new bearings to find out the effect of bearing friction on draught requirement in a camel cart. It was found that there was no significant difference in

draught requirement by the use of old or new bearings. The present results form the basis for the use of old bearings and thus reducing the manufacturing cost of a camel cart.

The Neglected Science Of Bullock-Tech.

Starkey P.H.
Sept.Dec.,1984.
A.H.M.P.

Draught animal power has been used as an integral part of the farming systems, since times immemorial. Truly speaking, a number of developing nations are labour abundant agrarian economics. Thus labour-intensive techniques coupled with draught animal traction can pave the way for tremendous production and employment generation at the grass roots in developing economics. The author has greatly emphasised on his important but neglected aspect of agricultural development of African economy in particular and of developing nation in general. African agriculturalist is now making increasing use of draught animal programmes. Starkey argues the need for much increased information exchange on the subject.

Development of an Animal-Drawn, Inclined-Roller Crust Breaker.

Awadhwai N.K.
March,1991.
A.H.M.P.

An animal-drawn, inclined roller crust breaker was designed, developed and evaluated in the Alfisol field. It completely breaks the soil crust, causes negligible injury to seedlings, and promotes emergence of pearl millet [*Pennisetum typhoides* (Burm.f.) Stapf and C.E.Hubb., syn. *P. americanum* (Linn.) Leake] and sorghum [*Sorghum bicolor* (Linn) Moench] to the level expected in the absence of crusting. It covers a 1 m wide strip, and its average field capacity is 0.35 ha/hr. The design is simple and it can be made locally.

AGRICULTURE

Development and Testing of a Donkey-Drawn Cultivator-Cum- Seeder.

Awadhwai N.K., S.V.R. Shetty, M.B. Traore.
June, 1990.
Agriculture

There is enormous potential for using the donkey as a draught animal for field operations in West African semi-arid tropics where soil are light and sandy. The existing

donkey-drawn implements, made of iron, are considered to be too expensive. A low-cost cultivator cum seeder to be pulled by a donkey was designed, developed and test in the Republic of Mali. The cultivator is made partly of wood and partly of iron. It can be used for inter-row weeding and presowing shallow tillage. It covers approximately 0.1 ha in one hour and its performance is as good as the commercially available Hoe Asine. The seeder can be used for sowing pearl millet and sorghum in hills about 50 cm apart and in rows spaced up to 90 cm. It covers approximately 0.2 ha/m while sowing in rows spaced 50 cm . apart.

Development of Bullock Drawn Multi Operation Tillage Implementation for dry farming.

Sharma Ajai Kumar, N.L. Sharma, Rajesh Sharma.
June, 1991.
Agriculture

The developed bullock drawn multi-operation tillage implement performs furrow opening, soil inversion, pulverisation and planking operations simultaneously. Draft of the implement was 71.3 kg. at 13 cm. working depth. 7.1 percent moisture content (D.B.) at operating speed of 0.83 m/sec and has effective field capacity of 0.042 ha/hr at 70 percent field efficiency. Estimated cost of the implement was Rs.350/- and operational cost (fixed+variable) was Rs. 253/ha.

Scope of Dissemination & Transfer of the Groundnut Decorticator: An Effective Approach.

Gupta Mohan Lal.
June, 1990.
Agriculture

The article gives a narrative of groundnut potential in different states of the country and describes the development of a groundnut decorticator at CIAE Bhopal. It explains in simple terms the working of such a device, the prospects of its use by rural women folk and the resultant gains to them by the way of drudgery-reduction, enhanced of earnings and related socio- economic benefits.

Implement Development for SAT Alfisols.

Bansal R.K., N.K. Awadhwai & V.M. Mayande.
March, 1991.
Agriculture

Field operations in Alfisols and related soils require timeliness and precision of the early establishment of a crop in the rainy season. Animal drawn, multipurpose wheeled

tool carriers (WTCs) have been found to be the most appropriate machinery for this purpose. Three designs are discussed in this paper covered 1 ha in 3-4 hours for different tillage operations, and could be drawn by a pair of oxen of average size. AWTC fitted with a planter-and-fertilizer applicator, consisting of an inclined plate for seed metering and oscillating mechanisms for fertilizer metering and double shoe furrow opener, gave excellent results in sowing various crops, and covered 1 ha in 4-5 hours with an average draft of 1530 N for four rows. A rolling crust breaker, developed to enhance seeding emergence through the surface crust, gave good results. Intensive primary tillage of Alfisols showed advantages in the early stages of crop growth, but they tended to disappear late in the season. Results of tillage studies conducted for 4 years indicate a need for further research to find out the comparative intensities of primary tillage the cropping season and off-season.

Modification of Water Hyacinth

Simlot M.M

July-Sept., 1985

Agriculture.

Dried powdered water hyacinth plant issue were made heavy to enable them to sink in the fermenting medium by mixing with soil in ratio of 4 : 1. The optimum concentration of water hyacinth slurry in the medium was found to be 4.5% to 6.25% and use of 4.5% is recommended to increase the amount of raw material for good biogas production. Addition of poultry waste decreases the lag period with simultaneous enhancement of biogas production from water hyacinth.

Increasing Labour Productivity in Agriculture.

Gite L.P.

September, 1988

Agriculture.

In India, the human work force involved in various agricultural operations is reported as 196 millions and constitutes about 18% of the total power used in agriculture. Most of these workers are in unorganised sector. This paper deals with various aspects of human power output and summarises techniques for increasing labour productivity in various agricultural operations.

Green House Cultivation: An Industrial Approach to Food Production.

Chandra Pitam.

June, 1990.

Agriculture.

This paper narrates concept of green house in augmenting and diversifying horticultural practices. As a brief case study of outlines the success achieved in the Green House Project of the Central Institute of Agricultural Engg. Bhopal.

Role of Vegetable Crops in Relation to Nutrition in Developing Countries.

Verma Amar Nath.

June, 1987.

Agriculture.

Only 28% of world's population are able to meet their dietary needs whereas remaining 72% most of which live in developing countries suffer with malnutrition or undernutrition. The developing countries need to reorient their programmes to produce right types of food, both in quality as well as in quantity. While much emphasis has been laid till now on the production of cereals more emphasis should be placed on production of vegetable and fruits. The dietary pattern in India is different from that in western developed countries as it is predominantly vegetarian or mixed, largely composed of cereal and deficient in protein, minerals and vitamins, resulting in malnutrition. Increasing the production of green leafy vegetable which rank next to milk for Vitamin A value and ribaflavin, fruits, vegetables which is a rich source of Vitamin B and Vitamin C, seed vegetables which contain about 23% protein and by weight contain more protein than meat, Roots & tubers, and breeding for high nutritive values will solve the nutrition problems of developing countries more easily. Proper agronomic measures through soil & water management, fertilization & plant protection etc. will improve the nutritional values of crops.

An Alternative Method of Insect Pest Control.

Sharma Neeta and Mira Madan.

December, 1987.

Agriculture.

It is not difficult to kill insects by the use of synthetic chemical insecticides with proper equipment. The chemicals used as insecticides mainly include organochlorinated, organophosphorus, carbamates or those of natural origin or from plants.

Organophosphorus and carbamate are very effective insect control but they are hazardous too, as it has residual effect in our animals food or in raw agricultural commodities. Because of the fact that the use of insecticide is hazardous, there should be some alternative method of pest control. This paper deals with the alternative methods of insect pest control.

Drying of Agricultural Produces Using Solar Energy: An Effective Post-Harvest Technology.

Gupta Mohan Lal.

December, 1987.

Agriculture.

Post harvesting is one of the major technique in keeping the food well-a highly essential need of human life. Storage of food in proper manner is the main problem. Solar drying can play a vital role in maintaining the quality and also to reduce the loss of agricultural produces. This presentation gives the salient features techniques to make use of solar drying technology for agricultural produces, designs of dryers and optimum temperature needed for dehydration of fruits and vegetables.

Defects in Agricultural Production Programme in India.

Bhadoria P.B.S.

December, 1987.

Agriculture.

The present study reveals that agricultural production in India during 1951-1983 increased by 126.8 tons. Nevertheless it was found that this increase in food production was still insufficient to meet the day today needs of growing population. The facts behind low food production are discussed and remedial measures to increase the overall food production are suggested.

Salt Affected Soils in India.

Rajendra K. Isaac and Narendra Swaroop.

March, 1988.

Agriculture.

The extent and characteristics of salt affected soils in India under different States & UTS is reviewed. It is estimated that 7.165 million hectares of land in India is salt

affected. The main causes of salt problems are of poor quality of irrigation water, poor drainage system topographical situation, aridity of climate and high water table. The main process occurring while irrigating with poor quality water were studied. It is found that the excessive soil salinity and alkalinity may adversely effect plant growth. The reclamation of these problematic soil can be done by providing integrated approach of Mechanical, Agronomical and subsurface drainage techniques.

Bio-Intensive Gardening.

Bhushan Rajeev.

Sept.Dec.,1984.

Agriculture

Biodynamic/French Intensive Gardening is a method of plant- raising that is simple to learn and perform, but is based on sophisticated principles dating back 4000 years in China, 2000 years in Greece and 250 years in Europe. In this method, crops are planted in beds which are prepared by loosening the soil to a depth of 1'. Using this method, one needs to spend only a few minutes in the garden daily-only one fourth as watering and weeding and for less effort than that anyone might be spending now. On these pages, Rajeev Bhushan analyses the history, prospects and methodology of the Biodynamic Gardening.

Neem : The Miracle Tree for Meeting India's Growing Energy Needs.

Prasad Ranjan.

March, 1988.

Agriculture

Neem is commonly known tree and grows naturally in Indian subcontinent. Besides medicinal properties, the paper highlights its significance in the country's energy needs for agriculture and Socio- economic impact..

Neem Plantation in Desert Through 'JALTRIPTI'.

Gupta I.C., P.M. Sinigh, N.D. Yadav, B.D. Sharma.

March, 1990.

Agriculture

The authors has discussed about the principles of 'JalTripti', basic construction of 'JalTripti' and its advantages.

Energy Plantation on Wasteland.

Vimal O.P.

September, 1987.

Agriculture

The concept of energy plantation is a recently developing one, which aims at growing those species of trees which are quick-growing and specifically meant for fuel. Keeping in view the unavailability of arable land for cultivation and good water for irrigation, the success of these endeavours depends largely on utilization of marginal lands and sewage water. In order to make this proposition successful, there is a need to undertake intensive studies on genetic and agronomic aspects with a view to improve the quality and production potential of the promising energy rich species.

Potential of Cut Flowers and Ornamental Plants for Internal and A New Technique for Plantation of Khajoor in Desert Soil.

Mertia R.S. & H.P. Singh.

September, 1991.

Agriculture

The authors have described about the techniques for plantation of Khajoor in desert areas. They have also explained about successful experiment conducted in the area and results have been discussed in this paper.

Appropriate Post Harvest Technology For Perishable Foods Of Dryland Areas

Jain Sanjay Kumar

June 1992

Agriculture

Although, the dry land area of our country is quite large, but this area is having low perishable food supply. It is estimated that about 30-45 percent of total production of perishable foods is lost in post harvest handling and processing.

In this paper the problems associated with the processing and handling of perishable foods of dryland areas is highlighted. Some solutions to these problems are suggested. It is suggested that there is vast potential of direct heating mode solar dryers in processing of perishable foods of dryland areas.

The traditional method of open sun drying has very limitations. These areas have plenty of sunshine hours for about 300-325 days in a year. The farmers may earn a net profit of Rs. 100 per day by simply investing Rs. 4000 in form of solar cabinet dryer.

Further, in this paper, some appropriate past harvest technology is identified and presented for Corn; Bajra, Gunda, Ker, Sangri, Kumtiya, and other perishable foods of dry land areas.

APPROPRIATE TECHNOLOGY

Papua New Guinea a Developing Country in the Clinch of Traditional and the Modern Way of life - Its Impact on Education for the Village Level and the Role of Appropriate Tech.

Dieter Kelin.

December, 1986.

App. Tech.

The author narrates in this article his first hand experience at grassroot level in the tribal communities of Papua-New-Guinea, a small island cluster trucked away in remote South Pacific. The narrative gives an interesting account of how certain communities of this region, with a primitive yet human social structure, survived the onslaught of European political expansionism, how certain others transferred into Western-orient "developed" communities and how his own experiments in appropriate technology education worked with them. Democratic model in a true sense, existed in these "aboriginal" societies at a time when most of the Europe steep under drakest feudalism. A "Stone Age" society, which in essence followed A.T. principles, survived longer than any of the European cultures.

Perspectives of Appropriate Technology.

Gupta R.P.

Sept.Dec., 1984.

App. Tech.

The present imitative mad race amongst various nations of the world and also between technocrats of various disciplines within one country, to develop a technological innovation without taking into consideration its scope of adaptability in a particular geo-physical and socio-cultural system, tends to prove that such efforts have done more harm than good to mankind. The author elaborates his view-points by drawing out parameters for the word "Appropriate" in relation to development of technologies. He has further suggested that a joint venture both by behavioural and as well as physical scientists in the development of appropriate technologies may prove helpful in getting the due out of it with minimum chances of losing sight of the main objectives in a particular activity.

Delivery System of Appropriate Technology for Rural Development

Kapoor R.N.

June, 1984.

App. Tech.

The employment in industrialised sector has increased from 12 to 19% of the global Work force. In agriculture sector it has decreased from 73% to 59% due to the impact of form mechanisation. These figures indicates that there is a need for developing self-sufficiency in rural areas giving greater emphasis to manual labour, animal labour accompanied by use of local resources available. For delivery at the rural level every cluster of 10-12 villages will need a Rural craft and technology centre capable of serving the community round it and involving active participation of villagers. In this article the writer throws light on how the committees should be constituted to plan and identify their own need, the importance of their being linked with Blocks and good technological institutions and the needs of the community for giving shape to future researches and education in our country.

Development and Promotion of Rural Technologies.

Sant Prof. B.R.

June, 1990.

App. Tech.

Development and promotion of rural technologies on a massive scale is needed more urgently than ever before. Apparently, the problem today is not that generation of technologies but of their transfer, acceptance and diffusion. This paper focuses the issues on income generating activities, technology transfer, its utilisation through rural industries.

Application of Ferrocement Structures for Factory Made/Cast-In- Situ Water Storage Tanks-An Appropriate Tech. for Indian Environment.

Singla P.K.

March, 1992.

App. Tech.

Recently various studies covering different aspects of water storage and supply system, both in Urban as well as rural areas of the Country, have been carried out but still a great deal of work is required to be carried out towards providing an adequate water storage and supply system. Adaptability to local surrounding, maximum use of local materials and manpower in construction and maintenance work, adoption of sound

but relatively simple methods of design, involvement of low overall costs and social acceptability should be the guiding factor in such systems. In this paper the work pertaining to the water storage system derived from ferrocement structures in New Zealand, Thailand, Rhodesia, Mali, Argentina and U.S.A. has been reported. The study provides the confirmation that the economy in this appropriate technology of ferrocement can provide a satisfactory basis for design of water storage and supply system in India, specially in the rural areas. The paper deals with design of water storage tanks of 9m capacity and various other ranges of capacities with nominal reinforcement and labour intensive simple construction techniques for factory/cast-in-situ ferrocement structures which have been given field trial and are being used in Punjab.

Appropriate Technology : Some important issues for the choice of Tech. and How to Transfer it in Developing Countries like India.

Singla P.K.

March, 1990.

App. Tech.

An Introduction to Appropriate technology has been given in this paper. Some of the important issues regarding the transfer of technology which should be borne in mind who is transferring the technology has been discussed. The important problems which are faced by personnels who are involved in rural development and problems has been given.

Appropriate Technology and Decentralisation.

Mathur J.S.

Sept.Dec., 1984.

App. Tech.

Whereas centralisation of any kind and more so of economic power creates a heap of problems, its decentralisation can offer remedial solutions to the problems of teeming millions living in rural India. The planning process in India has not been able to yield the desired results so far. The gap between the rich and poor has only widened. Industrialisation based on centralisation has given birth to many social evils and has further aggravated the economic conditions of the masses. Decentralisation of industries using local resources, coupled with appropriate technology can alone wipe out these evils and offer an honourable life to the villagers. Prof. Mathur, thus, calls for a drastic change in the process. The "top to bottom" has to be from "bottom to top".

CSIR Technologies for Rural Development.

Virdi M.S.

December, 1990.

App. Tech.

The crux of rural development lies in raising the living standards of rural and tribal people. Development of India can be achieved, primarily by developing the lives of the above, by steering the economy and wealth of this country towards them. Looking towards an urgent need for steering the vehicle of technology for rural development to the rural areas and for the material benefit of the rural masses, CSIR has taken up very appreciable step in this field. This paper is brief introduction of CSIR's technologies and its transfer to rural areas.

The Need for Appropriate Technology.

Srivastava H.C.

June, 1984.

App. Tech.

The basic needs for food, shelter and security led man to develop his requirements through the resources available in his adjoining environment. The writer here elaborates as to how technology which is appropriate for the masses is gradually developed and how technology should be adopted to fit the culture rather than the culture being forced to adapt to fit the technology. He further explains that the development of such technologies which can be of value of welfare of the community is of importance for the uplift of the rural areas of our country where three fourths of our country-men live.

Renewable Energy Sources for Rural Development

Bhaskar Dr. Deepa

September, 1993

App. Tech

With the problems of rapidly declining supplies of traditional energy sources, deforestation and increasing costs of commercial fuels, there has been resurgence of interest in the development and application of renewable sources of energy. The problems have been felt more acutely in the developing countries. At the same time, India is blessed with an abundant supply of renewable energy sources. In the article the author describes the potential of renewable energy sources and the application of biomass & biogas in rural areas.

BIO-TECHNOLOGY**Vermicomposting-A Latest Biotechnology.**

Madan Mira & Neeta Sharma.

September, 1986.

Bio-Tech.

Soil deterioration, increasing cost of fertilizers, increasing pollution through human, animal, food and agricultural residues are some of the major concerns facing mankind today. Earthworms with their peculiar characteristics of feeding, burrowing and excretion can help to meet these challenges. The present communication deals with the recycling of organic wastes through earthworms to meet fertilizer, food, fuel and animal feed needs consistent with pollution control.

Utilisation of Rural Waste Through Improved Bio-Technology Using Earthworm.

Madan Mira, Sherin Philip, Neeta Sharma and Sanjeev Verma.

March, 1988.

Bio-Tech.

Organic wastes in rural areas are diverse and abundant. Earth-worms are useful bio materials and through their characteristic of breaking up organic matter, combining it with soil particles and enhancing microbial activity show their capability of forming organic manures from waste organic matter. This paper deals with the role of earth-worms in recycling of organic wastes.

BIOGAS**Biomethane Production from Poultry Droppings.**

Ilamurugu K.K. & P. Rajasekaran.

September, 1986.

Biogas

To evaluate the usefulness of nitrogen rich waste like poultry droppings and the effect of addition of cow dung and biodigested slurry on the biogas yield during the anaerobic digestion, experiments were carried out with the above mentioned wastes, and the results discussed. The combination of poultry droppings, cattle dung and old

slurry helped not only in maximising biogas yield of 5225 ml. over a period of eight weeks, but also favoured maximum Methanogenic activity of $137.2 \times 10^3/g$. The cattle dung kept alone as control nowever could record only 3250 ml of gas output and $97.6 \times 10^3/g$ of methanogenic activity. Total solids (46.88 percent) and volatile solids (40.07 percent) destruction were observed in the popultury dropping, cowdung and old slurry incorporated traments. A positive correlation was observed between the cellulolytic and acid forming bacteria and gas output.

Biogas Production from Cattle Waste Supplemented with other Animals and Agricultural Waste in Field Plants.

Malik R.K & P. Tauro

September, 1988.

Biogas.

The effect of various animal and agricultural wastes at 5- 10% level alongwith cattle waste was tested in IM3 KVIC field plants for improved biogas production. During long term study, it was found that gas production in KVIC plants can be improved by about 10% by supplementing cattle waste with pig waste at 10% level. Saw dust supplementation appears inhibitory at retention time tested.

Generating Biogas from Agricultural Residues.

Sharma K. Sudhir , M.P. Sharma , I.M. Sharma.

September, 1990.

Biogas

Leaves and stems of papaya plant were digested anaerobically at $37^\circ C$ in 5-litre capacity batch digesters. The results show that under the uncontrolled conditions of pH and total volatile fatty acids the digesters fed with the leaves of papaya, failed and only 171 litre biogas/kg of total solids was produced within eight weeks of digestion period, whereas under controlled conditions the total biogas production was 434 l/kg. total solids. In the case of papaya plant stem, there was no drop in pH value in Acidic range but the total biogas production was only 169 l/kg of total solids.

Biogas Production-from Sheep Waste and With Cattle Dung

Pathak S.N., D.N. Pandey & D.k. Savita

Sept.'1992

Biogas

It is well known that cattle dung is not available in sufficient quantity to meet the biogas production from biogas plant. That is why needs for additional feeding

material which may mix with cattle dung and enhance the biogas production. Like other organic waste sheep as a suitable feed material for more biogas recovery and is available in rural areas. In view of this laboratory study have been made to study the effect of mixing sheep waste with cattle dung. The result shows that for maximum biogas recovery from sheep waste and cattle dung can be obtained by mixing it in 3:1 ratio.

A New Aspect of Corrosion in Biogas Plant

Singh J.P., S.k. Singh & G.N. Pandey
Sept.'1992
Biogas

Certain acids like acetic, formic etc. are precursors of biogas generation which during the biomethanation process promote corrosion of metal and ferrocement in presence of alcohol. A trace amount of some alcohol is also produced from microbial biodegradation of organic waste materials in biogas plant. In the present investigation, the effect of the presence of acetic and formic acid on corrosion of ferrocement has been studied. It was observed that the corrosion value increased with the increase in the acid concentration from 10 ppm to 1000 ppm. Formic acid was generally more corrosive than acetic acid.

Garbage Gas Mannure Plant.

Parikh Rahul.
December, 1988.
Biogas.

Waste material or garbage which till now has only been a health and sanitation hazard for the urban and rural areas, is now being utilised for the benefit of human race. Gas Manure Plant creates wealth from waste, and a fresh unpolluted environment.

Suggestions for Optimum Performance of Community Biogas Programme

Rao A.Rama.
April-June, 1985
Biogas.

The anaerobic digestion holds greatest promise in the recovery of energy from urban and rural waste because it seems to be the most economical and get environmentally satisfactory method of treating such waste. Keeping in view the utility of biogas plants Community Biogas Programme is launched by Government. Here the

author states practical and useful suggestions for successful management of Community Biogas Programmes.

Synergistic Interactions of Microbes in Nightsoil-Cowdung Biodigestion.

Rajasekaran, K.R. Swaminathan.

March, 1989

Biogas.

The solution to the search for alternative of future fuel clearly lay in the direction of converting the ample supply of cowdung into biogas. This paper is a study of experiments mixing nightsoil with cowdung which enhances biogas output and accelerates microbial activity.

Factors Affecting the Anaerobic Process for Biogas Production.

Syed Anis Ahamad.

June, 1991.

Biogas.

The paper discuss about the various factors affecting in the process of anaerobic fermentation for biogas production and their significance for the optimum gas production in a biogas plant. It also elaborates the limits of the various factors for proper functioning of the biogas plant. This paper is based on the experiences gained by technical experts working in the field of bio-energy.

Family Biogas Plants-A Case Study.

Moulik T.K.

June, 1991.

Biogas.

Biogas Technology is being promoted in India on a mass scale to meet one of India's most important energy needs i.e. cooking (its constitutes more than 70% of total rural India's energy needs). Biogas has received special attention because of the easy applicability. It also provides cheaper fuel for lighting and domestic purposes, provides cheaper and enriched field manure and improves the environment by keeping the kitchen clean and hygienic and decreasing the drudgery of women.

Economic Analysis of a Large Size Biogas Plant.

Vyas Dr. S.K.

March, 1992

Biogas.

Community Biogas Plants are being increasingly adopted in the rural India as a source of energy to meet with the requirements for cooking, lighting, irrigation and other agro processing operations. Not enough literature is available on economic analysis of such plants. In this paper economic analysis of a 140 Cubic meter plant using the conventional technology and high rate digester technology has been made. The analysis reveals that large community biogas plants are economically viable.

Energy Generation through Anaerobic Bio-Digestion of Oil Cake Incorporated Organic Wastes.

Rajasekaran P, K. Chendrayan and K.R. Swaminathan.

March, 1987.

Biogas.

The biogas production potential on non-edible castor oil cake along with cowdung was investigated through anaerobic bio- digestion process using bio-digested old slurry and sewage sludge as initial starter inoculum. The gas output measured over a period of 12 weeks indicated the potential production of 1045 ml/g of total solids destroyed when compared to cowdung alone (988 ml/g of TS destroyed). The amount of gas produced was more during the early phase of digestion when digested old slurry was used as inoculum. The distribution of acid forming, cellulolytic, lipolytic, proteolytic and methanogenic bacteria indicated a close positive correlation between gas output and methanogenic population. A comparatively high nitrogen content was estimated within the oil cake incorporated treatment. The carbon dioxide content obtained of the biogas, varied from 34 to 48 per cent during different stages. The data reveal a favourable trend towards the usefulness of non-edible nitrogen rich oil cakes in biogas generation.

Manurial Properties of Biodigested Slurry of Various Waste Incorporated Treatments.

Rajasekaran P, S. Kamaraj, K.Sankaran & K.R.Swaminathan.

June, 1987.

Biogas.

Organic substances such as human, animal and agricultural wastes, through fermentation can produce not only an excellent gasfuel, biogas but also a large quantity

of digested sludge and effluent which is an excellent fertilizer. This paper is brief account of laboratory investigation and research work done by the author and his team.

Factors Influencing Biogas Generation, Operation and Maintenance of Digesters.

Singla P.K.

September, 1989.

Biogas.

The paper describes about the anaerobic digestion and various factors influencing the anaerobic digestion and generation of biogas. Maintenance of biogas plants and digester. Brief description of biogas and its application in internal combustion engines. Conversion of small existing spark ignition engines to operate on biogas has also been discussed in this paper.

Fixed Dome Biogas Plants Developed by TERI.

Kishore V.V., P.Raman. V.V. Ranga Rao.

September, 1987.

Biogas.

Biogas technology offers a low cost alternative for energy requirements in rural areas. Different types of digester have been developed in view to increase the yield of gas, reduce the cost of this technology and bring it within the reach of common people. The fixed dome biogas plant has gained a certain popularity as it uses local skill, locally available raw materials, is cheaper to construct and entails minimal maintenance. This paper presents the cost comparison of three models of TERI Fixed Dome Biogas Plant with Janata model.

Biogas Generation-Effect of Mixing Effluent Slurry with Fresh Cattle Dung.

Sharma S.K., J.S. Saini, I.M. Mishra & P. Sharma.

September, 1989.

Biogas.

More than 70% population of India are living in villages. Village people are utilising cow dung for production of biogas for meeting out their domestic energy requirements. The main product of an aerobic digestion of cattle dung are biogas and nutrient rich effluent slurry i.e. biofertilizer. It has been observed that the effluent slurry is not completely digested due to some technical problems. In order to extract the residual energy from

incomplete digested effluent slurry and to improve the economics of existing biogas plant it is very essential to recycle apart of effluent slurry mixed with fresh cattle dung. In view of this, laboratory study have been made by the author to study the effect of mixing incomplete digested effluent slurry with fresh cattle dung. The result shows that as the percentage of effluent slurry in fresh dung slurry is increased the total gas production is also increased.

Biogas Production from Cellulosic Wastes.

Rajasekaran P, S. Krishnaveni and K.R. Swaminathan.

September, 1987.

Biogas.

Biomass containing high cellulosic materials can meet energy requirement to a greater extent if utilised by the technologies already existing. In this paper author has highlighted some specific observations regarding biogas production using willow dust.

Biogas Plants & Their Establishment.

Srivastava H.C.

September, 1989

Biogas.

The article gives an overview of the biogas technology, status of its utilisation and rudimentary design calculations relevant to user. It also gives an informative resume of outstanding advantages at micro levels that accrue, through adoption of this technology, supported by an illustrative case study.

Effect of Addition of Gypsum and Sulphur on Microbiological Activity and Biogas Production.

Rajasekaran P. & T. Srinivasan.

September, 1989.

Biogas.

To evaluate the interactions of sulfidogenic and methanogenic microbial communities due to incorporation at various levels of gypsum (experiment I) and elemental sulfur (experiment II) along with cowdung, batch experiments were carried out at $28^{\circ} \pm 2^{\circ}$ C for a period of eight weeks. Reduced microbial activity such as acid forming ($\times 10$), cellulolytic 10^4 methanogenic ($\times 10^3$) and sulfidogens ($\times 10^3$) leading to reduced gas

output was observed as compared to control treatments in both the experiments. Addition of gypsum and elemental sulfur inhibited methanogenesis due to competitive interaction of sulfidogens for substrates in anaerobic environments, rich in sulphur containing compounds.

Effect of Temperature on Biogas Production from Water- Hyacinth.

Singh S.K., Upama Mishra, G.N. Pandey & Amarika Singh.

December, 1991.

Biogas.

Anaerobic digestion of water hyacinth (*Echhornia crassipes*) carried out at different temperature range (30-39° C) and hydraulic retention period (0-35 days). The gas production increased sharply as the temperature were raised above 30° C and maximum yield was observed at 37° C, rather than 35° C, but production reduced after 37° C. In this paper, the effect of temperature on biogas production from water hyacinth is highlighted.

Effect of Biogas Spent Slurry Applied in Combination with Chemical Fertilizer on Yield and Yield Components of Sorghum.

Jagadeesh K.S., & Geetha.

June, 1989.

Biogas.

The effectiveness of biogas spent in substituting chemical nitrogenous fertiliser was studied in sorghum crop under rainfed conditions. It was observed that the slurry could substitute nitrogenous fertiliser to the extent of 50% of the recommended dose without affecting the yield and yield components.

Biogas Plant Failure: Causes and Remedies

Sudheendra S.Vyas, Virendra Kumar Vijay, Narendra Kumar Metha.

September, 1990.

Biogas.

India, having the largest cattle population in the world, provides a vast potential for generation of biogas. Government of India being aware of the fact launched National Project on Biogas Development in the year 1981 with a view to setting up biogas plants throughout the country. A number of plants have been constructed under the project so

far but their functionality has been found low because of a variety of problems administrative, technical, social or otherwise. The present paper deals with such problems in details and their possible remedies. The removal of all such problems will help establishing biogas as one of the most reliable sources of domestic energy in India.

Biogas Output and Microbial Properties of the Solid State and Aqua Diluted fermentation of a few Value Added Biomass.

Rajasekaran P.

June, 1991.

Biogas.

This paper discusses the usefulness of some wastes like poultrydroppings, poultry litter and spent mycostraw of biogas production in the form of solid state either alone used or with cattle-dung. In this paper the microbial properties of the solid state fermentation of wastes is also described. In this regard several experiments have been carried out to understand the nature of microbes involved in biogas production and exploration of the possibility of extending this type of technology in the areas where supply of water is limited.

BIO-ENERGY

Waste to Wealth.

Singh Jagpal, Mansoor and M.M. Verma.

March, 1987.

Bio-Energy

In India where major resources in rural areas are agricultural wastes and a variety of fast growing hardy plants like shrubs and certain weeds, It is important to examine these as potential raw- materials for small industries. The present paper purports to give a detailed account of an abundantly growing weed, *Saccharum munja* (Gramineae) with a high biomass potential about 90 tons ha/year fresh weight and growing on wastelands requiring little agricultural inputs. This weed can yield much more than conventional crops make the village self dependent in some materialistic needs.

To Evolve Simple and Cheap Technique for Slurry Utilization

Pathak S.N.

September, 1989

Bio-Energy

Energy crisis and fast depleting natural resources has proved the importance of renewable sources of energy. In search for renewable resources biogas plants established their recognition. Besides fuel gas they provide humous and nitrogen rich manure. Present paper is a study to increase the manurial value of slurry by addition of different waste materials.

Producer Gas from Biomass and its Application in Internal Combustion Engine.

Kandpal J.B., Ashok Kumar and R.C. Maheshwari.

September, 1988.

Bio-Energy

As our natural fuel resources are limited, the producer gas produced from charcoal can be used for small scale industry such as power generation or irrigation purposes. Downdraught gasifiers using charcoal as fuel gives best quality of producer gas which can be used in small scale industry or lighting purpose of small communities. More emphasis has been given to various problems arises with the use of direct biomass for power generation for its use in internal combustion engine.

Bio-Energy for Rural Development-Problems & Prospect (An Experience with Villagers).

Tyagi A.K. & P.D. Tyagi.

June, 1986.

Bio-Energy

The main thrust of this paper is not to simplify the problems involved in biomass energy development. Rather, the emphasis is placed on pointing out the issues that must be considered in arriving at an effective policy on biomass development and on highlighting the important influence of choice and viability of particular biomass systems and their future.

Energy from Agricultural Residue.

Centre for Development of Rural Technology, Allahabad.

July-Sept., 1985

Bio-Energy

Crop residues and agricultural wastes are very potential and important source of energy. To determine the extent of this potential and to aid the development of the

resource, detailed information is required on the production, geographical distribution, seasonal variation, annual variability and likely future changes in production of wastes and residues. This compiled information can be used to optimise the location and size of energy conversion plants and processes. The data described in this paper on conversion processes may be used for selection of suitable residues for different conversion processes to maximise the efficiency.

Development of Efficient Feed Supply System of the Mobile Stirling Engine.

Rathore N.S, A.N. Mathur & Surendra Kothari.

December, 1991.

Bio-Energy

The Stirling Engine can make a major contribution to energy conservation and improved energy conservation using agricultural wastes which do not require expensive and extensive processing. However, based on actual working of stirling engine mounted on the mobile carrier for onfarm applications various limitations in different systems have been observed. The feed supply system requires major modification to use wide varieties of biomass. This paper deals with modification carried out in feed supply system of existing stirling engine in terms of design, development and testing of different type of screw flights.

Involvement of Women in Bio-Mass Energy Programmes in India.

Mukherjee Partha Sarathi.

March, 1989.

Bio-Energy

Three fourth of our country's population depend mainly on Biomass . These resources have, however not been exploited fully and are capable of greater utilisation. In the present paper author has discussed the role of women for the efficient utilisation and Production of biomass in the rural household sector.

Technological Options for Utilization of Agricultural Residue.

Rajan A. Sampath, K.R. Swaminathan.

July-Sept., 1985

Bio-Energy

Enhanced crop production leads to the production of by products and residues. Agricultural residues offer a viable biomass in energy production as a substitutes. This

paper discusses the technology of utilization of agricultural residues for various applications and discusses certain promising residues with respect to their utility and limitation.

Efficient Utilization of Biomass from Non-Conventional Plants as Solid Fuel.

Singh Arvind, Mira Madan & Padma Vasudevan.

June, 1987.

Bio-Energy

Biomass refers to a variety of plants material which can be used as feedstocks for conversion to useful fuels and products. Biomass feedstocks include such diverse materials as agricultural plants and residues, tree, forestry residues, manure, aquatic plants. Although it is technically feasible to thermochemically convert any of the biomass feedstocks, it is necessary to consider availability and abundance of the feedstock and potential conversion economics in selecting them. The focus of this paper is the utilization of biomass through direct burning and carbonisation.

Charcoal Utilisation Pattern.

Vimal O.P.

March, 1985.

Bio-Energy

Charcoal is used mainly as domestic fuel for cooking and heating, but large amounts also find a number of metallurgical and chemical applications. Carbonization of wood into charcoal, though considered to be very simple in operation, in fact implies a certain sequence of steps in a production chain, all of which are important and need to be carried out in the correct order. The present communication is an attempt to discuss the utilisation pattern, carbonization alternatives, stages or unit operations, parameters determining the quality of charcoal and performance indices of carbonising equipment. The success of this proposition depends not only upon a thorough understanding of the chemistry, technology, energetics and economics of charcoal making but also quantity and quality of feedstock, drying transporation, storage and distribution problems. Despite the fact that charcoal making has been practised both by subsistence producers as well as by commercial entrepreneurs but in the context of recent changing energy scenerio detailed studies need to be carried out to establish its long-term viability.

Technologies for Briquetting of Agricultural Forestry Biomass-Its Costs and Energy Return.

Srivastava P.K. R.C. Maheshwari and D.D. Agarwal.

July-Sept., 1985

Bio-Energy

Amongst various options for conversion of biomass into energy intensive fuels, briquetting is a simple and economic proposition which is expected to yield an economically viable solution to the density, volume, storage handling and transportation problems of different types of biomass. This paper describes these technologies and present a discussion on the economic aspects as well as on the energy input/output analysis.

Optimal Utilization and Recycling of Organic Residues.

Sharma S., P. Vasudevan and M. Madan.

September, 1987

Bio-Energy

The organic or agricultural substances present in the rural areas can be recycled by mushroom (*Pleurotus sajor-caju*) cultivation and anaerobic digestion. In the present study, the selected plants *Morus alba* and *Ricinus communis* have been screened for *Pleurotus sajor-caju* cultivation. The yields of *P.Sajor-caju* were higher on *Morus alba* and *Ricinus communis* thin branches in comparison to leaves. The spent residues after cultivation of this mushroom were utilized for anaerobic digestion. Biogas yields from *Morus alba* (thin branches, leaves) and *Ricinus communis* (thin branches and levels) were 123, 89.2, 107.6 and 84.6 litre/kg dry substance respectively. Yields from the spent residues of these raw materials were 136, 101, 126.9 and 93.8 litre/kg respectively from dry substrates. The maximum gas yield recorded was 156 litre/kg from dry silkworm waste and the minimum was 83 litre/kg from castor cake. The methane content was also high in the case of silkworm waste. They slurry with high fertilizer value can be utilized as manure for agricultural purposes.

Coconut Residues for Metallurgical Applications.

Pillai R.M., K.G. Satyanarayana, B.C. Pai, P.N. Mohandas & K.G.K. Warriar.

September, 1987

Bio-Energy

Attractive features viz., low ash, low sulphur and low phosphorus contents of coconut pith and shell were exploited in finding new uses for them in metallurgical

industries. Work carried out at the Regional Research Laboratory, Trivandrum on these renewable agricultural resources have established their possible uses as (a) filler (coconut shell char) material in aluminium and copper matrices to develop composite materials exhibiting special properties (b) metallurgical fuel (shell char) for melting metals and alloys, and (c) reductant (both pith and shell chars) to reduce beneficiate metallic ores. Production of chars from these lignocellulosic materials, their structure property relations, special properties obtained in metal matrix composites when char is used as a filler material and the benefits of using these chars as metallurgical fuel and reductant are briefly described.

Re-Cycling of Wastes and Treatment of Polluting Residues...The Green Gold.

Hoda M.M.

September, 1987

Bio-Energy

Dried Biomass have been recognised as important and viable resources of renewable energy, these resources have, however, not been exploited fully and are capable of greater utilisation for energy production. Economical and appropriate technologies, therefore must be adapted for maximum utilisation of biomass available locally. In this way economy of the poor rural folk can be regenerated and present crisis can also be minimised.

Fuel Characteristics of Agricultural Residues.

Maheshwari R.C.

December, 1990.

Bio-Energy

The author has described fuel characteristics of rice husk IR-8. The fuel characteristics like calorific values proximate analysis, ultimate analysis, has been presented in tabular form Various physical parameter which affects the burning rate of rice husk has also been considered. The behaviour of properties of fuels also has been presented graphically.

Comparative Evaluation of Kilns for Charcoal Production and Case Study of Transportable Charcoal Kiln.

Srivastava H.C.

March, 1986.

Bio-Energy

Charcoal has been produced in primitive earthen kilns from the dawn of civilisation. Charcoal is per dominant house hold fuel in urban as well as rural areas. A

transportable charcoal kiln fabricated and tested at I.E.R.T., Allahabad can produce charcoal very quickly and efficiently compared to pit and earth kilns. The kiln has been designed by Tropical Development Research Institute, London, U.K. This article highlights clear description of the kiln, site selection, assemble and firing of the kiln. A brief report on the field trial of the Charcoal Kiln gives an idea about the economic and employment generation potential of this technology.

Economics of the use of Tree Leaves as Fodder

Chaturvedi A.N.
September, 1993
Bio-Energy

In this paper author has made comparative study of use of biomass which is fed to cows, buffalows from the economical point of view. He has briefly discussed about basic principles of photosynthesis, leaf structure, leaf shedding and how much wood can be obtained from trees.

ENERGY CONSERVATION

An Investigation on the Utility and Efficiency of Traditional as well as Various Improved Chulhas available for Rural Bangladesh.

Ibrahim M., S.M.H Bakhari, S. Rafique
March, 1986.
Energy Conservation

Colossal wastage of bio-mass fuel led to the development of improved chulha, with better efficiency. Although various improvements in efficiency have been claimed and observed. Systematic measurement of efficiency of conventional as well as the improved "Chulhas" under different modes of use is the requirement today. In this article the authors have discussed about different types of chulhas, their fuel efficiency, their construction and other aspects .

Scope of Decentralised Energy Options and Energy Conservation in Rural Sector

Srivastava Dr. S.K.
December' 1992
Energy Conservation

This paper deals about the various options for the rural sector in the perspective of decentralised energy. The author has given the present energy scenario in various

sector, future availability of energy and demand have also been elaborated. He has also suggested energy conservation methods in different sectors.

Wood Burning Cook-Stoves (Chulhas) In Rural India.

Srivastava J.C.

March, 1990.

Energy Conservation

Fuelwood supplies for cooking and warmth, are getting scarce due to indiscriminate cutting of wood with consequent environmental hazards. Since the traditional method of cooking food on cook stoves made of mud will continue in rural areas, one of the immediate solutions to the problem is the development of new/improved models of fuel efficient smokeless cook-stoves (chulhas as they are called in India). A number of fixed and portable types of "chulhas" have been developed in India to meet the varying needs of rural women. The case study presents the efforts made in the transfer of technology of these chulhas in rural areas to mitigate the problem of fuelwood scarcity; to effect time saving in cooking and to eliminate health hazards and drudgery of women due to smoke. It has been experienced that education, incentives and availability of maintenance and repair services near the doorsteps of the beneficiaries are the major factors in the successful transfer of this technology.

Extension, Promotion and Acceptance of Improved Cookstoves.

Njoku Archana, & R.C. Maheshwari.

March, 1990.

Energy Conservation

In this paper the authors have discussed the problems regarding acceptance of improved "Cook Stoves". Draw backs of improved Cook Stoves. Lastly they have suggested solutions to the problems.

Energy Utilization of Some Hardy Species Grown on Waste Land

Kandpal J.b. & Mira Madan

December'1992

Energy Conservation

Plantation of energetic species in one of the most important sources to meet the present energy requirements. For growing these plants studies were done on nursery raising of a number of fuel-wood species and plantation of them on waste land.

The energy value of the biomass and charcoal produced from the biomass species having highest and lowest energy content was determined. An energy analysis of both the fuel i.e fuelwood and charcoal was done which favour strongly charcoal production for better energy utilization and least indoor air pollution during energy use.

Biofuel-An Immediate Substitute of Fuel Wood

Nema B.P.

March'1993

Energy Conservation

In order to prevent further deforestation and the associated environmental damage the agro-waste has converted into kitchen fuel with immediate aim to conserve forest. The agro-waste from soybean, arhar were pyrolysed for char and further briquetted it with mud/slurry.

'Anupam' Chulha-a Device for Fuel Saving in Rural Sector.

Santosh & Rajendra Singh.

June, 1984.

Energy Conservation

In this article we are told about the new design of "Anupam" Chulha. Dimensions of "Chulha" and proper combustion of fuel as these are the two main constraints in designing a new model. Efforts for new models are on and some new designs having single firehole have come forward. Optimisation of the dimensions, Construction Procedure, Efficiency, cost of the Chulha and Unique features of the Chulha are discussed in details by the author.

ENERGY

Third World Fuelwood Plantations-An Overview.

Ken G. Mac Dicken.

April-June, 1985

Energy

Fuelwood and charcoal provide two third of all energy used in Africa and a third of that used in Asia, Wood in fact, supplies the equivalent of 15 million barrels of oil per day. 80 percent of which is used for cooking. Indeed, one of the worst problems facing

the developing world is the shrinking availability of fuel. As fuel wood becomes less available, the burden of collecting and transporting it, which usually falls on women and children, general adds to an already lead. Fire wood prices have risen over the last decade in India more than 2.5 percent per year above inflation. The widening circle of fire wood collection, moreover adds to the deforestation, soil erosion and also making the earth less fertile. The onliest possible answer to this crisis is plantation which is well described in this article.

"The Status and Need for Decentralised Energy Systems in India

H.C. Srivastava.

March'1985.

Energy.

As energy consumption continues at a hectic pace, fear grows that the tank may run dry before we reach the point of rendezvous with our future fuels. Fear grows that man may fail to react fast enough. Fortunately, some men seem to have got the energy message, many are now performing the basic scientific and engineering research that goes into the development of safe and reasonable economical technology to keep the lights on. This vital theme of decentralised energy planning is described and analysed throughout the paper by the author.

An Alternative Strategy for Rural Energy Utilisation.

Bhadoria P.B.S.

June, 1986.

Energy.

The writer in this article enlightens on Alternative Strategy for Rural Energy. Technology in use determines the source and the way energy is used, whether the source of energy will be the human being or animal power or directly Solar and Wind etc., is determined by the type of technology used in a particular society.

Linking Energy Projects with Rural Development Schemes.

Srivastava Dr. J.C.

March, 1985.

Energy.

Non-commercial sources of energy in rural areas are fast declining, resulting in an ever increasing gap between demand and supply. The rural people in general and the economically weaker sections in particular can hardly afford the present energy

costs. Efforts are, therefore, in progress to develop and promote non- conventional energy technologies which could meet basic agricultural and domestic needs and some additional tasks currently not feasible. The objective should be decentralising energy planning, harnessing location specific energy sources and appropriate energy technologies and their adoption by the rural beneficiaries. This objective could be usefully achieved by linking these with the ongoing rural development schemes at the district level downwards. Rural Technology & Training Centre of the district (as proposed by the author) could be the focus of transfer of technology including energy technology in rural areas. The paper discusses the scope and viability of the proposed tieup.

Integrating the Village Plans with Energy Planning.

Bhadoria P.B.S.

June, 1987.

Energy.

Energy policy is perhaps, the most difficult among the national policies. If we get our energy policy right, many other kinds of policy will tend to fall into right place. At the same time energy policy cannot be made by consideration of energy alone. It has to be projected from the economic framework and viewed in different time scale.

Decentralised Energy Planning for Rural Development-Role of NABARD.

Pant S.C & S.K. Adlakha.

April-June, 1985

Energy.

Decentralisation of rural energy is a must for proper and speedy rural development. Government of India is very much concerned about the problem of rural masses for which a separate department has already been established for adopting non-conventional sources of energy. Government is giving subsidy for adopting these sources by means of established system such as wind mills, biogas, solar photo-voltaic pumps etc. NABARD is a institution set up by the Govt. in order to fulfil the gap of finance through institutional finance. In this article the authors describe the efforts made by this organisation in order to use the non-conventional energy sources.

FORESTRY**Feasibility Study of Su-Babul Plantation-A Case Study.**

Birla Inst. of Scientific Research.

April-June, 1985

Forestry

Wood is a basic resource for meeting human needs. It has always been important as a fuel and building material. But the expanding human settlement have threatened and eventually destroyed forests. As the problems, caused by deforestation are becoming better understood, development planners are scrambling to find temporary and long term solutions. This paper is an approach to asses quantity of yield, quality of wood and profitability of Su-Babul plantation.

Womens Involvement in Forestry Activities.

Madan M., V.Peris.

September, 1990.

Forestry.

It is well recognised that rural women folk, who possess skill in many arts and crafts have tremendous potential for not only earning livelihood but also creating remunerative ventures, provided they are given adequate training and other necessary support. The article highlights the aim of the women's involvement in forestry activities to ensure the satisfaction of their needs of fuel fibre, food and fodder.

Role of Social Forestry for Rural Economic Development in India.

Kumar Rakesh Vimal & Mira Madan.

December, 1989.

Forestry.

The paper deals with the Social forestry and its impact on society. Various programmes launched by Govt., aims and advantages and its impact on economy has also been discussed.

GENERAL TOPIC**Technologies for Mass Employment.**

Colin Norman
December'1985
General

Unemployment is today the most pressing social and political problem in the world in general and in the developing countries in particular. Capital intensive, energy consuming, labour saving technologies developed in the industrialized world have lost their credibility at least in the Third World countries since these require the resources which are scarce and expensive and leave abundant asset-manpower unutilized. Millions of new jobs must be created by the year 2000 to end the global unemployment. The author has emphasized the role of labour-intensive technologies in industries, agriculture and public works programs alike in providing massive employment and promoting development. Governments in the industrial world as well as in the developing world must pay increased attention to the link between employment and choice of technologies.

Experiences of a Community Polytechnic.

Chalapathirao G.
April-June, 1985
General.

The question of developing an effective method in the application of Science & Technology for the solution of social problems continues to be a matter of serious concern for our Country. A few selected polytechnics should act as focal points to promote the transfer of technology to the rural community. The author states in an illuminating way about his experiences with such a Community Polytechnic.

Thermal Bonding Machine

Kannakumar R., N. Anbumani, K. Sundaresan & Prof. K. Jayachandran
Sept.'1992
General

In this paper the author has discussed about the principle of thermal bonding. The author has also discussed about constructional feature, principle of operation of thermal bonding machine.

Impact of Watershed Management on Dairy Development in Shivalik Foothill Villages

Arya Swaran Lata, Y. Agnihotri & S.p. Mittal

June'1992

General

Earlier the Shivalik region of Northern India had lush green forests supporting large herds of milch animals and there was abundance of milk yield. With the passage of time, due to increasing population pressure, the area has been denuded resulting in replacement of high yielding by less productive milch cattle and deficit in milk yield. Integrated watershed management projects were taken up in Sukhomajri, Nada and Bunga villages of Haryana and also in Una District of Himachal Pradesh to rehabilitate the denuded areas on sustained basis and ameliorate the socio economic status of the people residing there. The projects were bond to increase the fodder availability and bring about a drastic change in cattle composition and availability and bring about a drastic change in cattle composition and availability of milk. Impact of the aforesaid programme on dairy development has been evaluated and presented in the paper.

There was 400 percent increase in fodder availability from forest area and 150 percent increase in fodder from agriculture crops in Sukhomajri. Similar increase in village Bunga was to the tune of 378 percent and 428 percent, respectively. Una watershed registered 81 percent increase in fodder from agriculture crops. Availability of fodder led to consequential increase in number of good breed buffaloes and so in milk yield.

There was an increase of 100%, 46, 91% and 77% increase in milk yield in villages Sukhomajri, Nada, Bunga and Una respectively as a result of taking up watershed management programmes. The benefit cost ratios as a result of the programme worked out to 2.31 for Sukhomajri, 2.12 for Nada, 2.42 for Bunga and 1.28 in case of Una watersheds.

Thus the watershed management programmes in the adopted villages have gone a long way to provide a definite boost to dairy development.

Development of Garlic Clove Peeling Machine

Vyas S. Sudheendra, Ramesh K. Maddot & Yusuf Ali

June'1993

General

Garlic (*Allium Satium*) is a pcrennial herb grown in tropical and subtropical planes of the country. The crop is widely used in the formation of spice mixture of

various foods. It is also important from medicinal point of view as it is used in the preparation of medicines for curing heart, lungs and intestinal diseases.

Although the crop is so important yet no mechanical equipment is available to peel its product which is the foremost work in its utilization. The present paper deals with one such machine. The primary tests conducted on the machine showed that it was successful in peeling garlic cloves effectively and economically.

Comparative Performance of Different Designs of Net-case Incubators of Carp Hatchery System

Khandagiri P. & S.k. Dash

June'1993

General

A study was undertaken to compare the performance of different designs of net - case incubators from the point of view of uniform dispersion of eggs inside the incubators and mixing pattern of incoming water with a view to suggest the optimum design. The designs under study were cylindrical, divergent and convergent shaped incubators with full open, full cover, bottom open and top open sides. Thus, in total 12 designs were considered. The results indicated that for minimum creation of dead zones, cylindrical design was best followed by divergent and convergent designs. Most uniform spacing of eggs was found in the full cover and bottom open designs of cylindrical and divergent incubators. Considering both dispersion of eggs and removal of ammoniacal products, cylindrical design with top open was adjudged to be the best type of incubator.

Operational Research Trials on Onion Storage Structures at Rural Level

Gupta R.k. & B.d. Shukla

June'1992

General

Two concentric perforated type storage structures developed at CIAE were evaluated for their performance at farmer's field in the village Nabi Bagh. The structures were made of 25x25x25 mm welded wiremesh and each having storage capacity of one tonne onions. Constructional design of both the structures were same except that natural air was used in one structure whereas the other was attached with a blower to circulate the forced air. The first structure (natural ventilation type) was placed outside whereas the second one (forced air circulation type) was kept inside the shed. Onion were filled

at the same time in both the structures and kept for about four months. Performance of both the structures studied on the basis of maintaining onions quality during storage period. About 7 and 4% losses in natural and forced air ventilated types structures were observed respectively at the end of storage period. Both the structures performed well and have been found economical and suitable at farmer's level.

Sericulture: An Income Generating Community Based Programmes for Rural Women.

Saluja, N., P. Vasudevan and M. Madan.

June, 1986.

General.

The Seventh Plan emphasises on the society related science programme. In the view that Science & Technology is to play a role in national development. India is making special attempts to compete with the world in sericulture technologies. The concept of division of labour-women on domestic front and men as earning partners-has under gone a thorough change. The authors discuss the importance of introducing sericulture for economic uplift of women in rural areas especially through community approach.

Seed-India's First Village Republic.

Agarwal Anil & Sunita Narain.

Sept., 1991

General.

The authors has given brief description of management and policies adopted in tribal village SEED. They have compared the policies with another villages and suggested how these policies can be implemented in other villages.

Development of a Low Cost Extruder for Soyproducts.

Patil R.T. and Nawab Ali.

March, 1991.

General.

A low cost single screw forming extruder costing about Rs.15000.00 has been developed to produce say cereal blended snack foods. It has a capacity of 25 kg/h and can extrude say cereal blends at a moisture content of 30% wet basis. The product is well mixed, porous and in strands form which is further dried and flaked. The product

thus obtained is deep fried and consumed with sprinkling spices and salt as per taste. The say cereal blended flakes (30:70) had protein content of 21.37, 20.18 and 20.67% for wheat, sorghum and maize flakes. The bulk density were 259.94, 283.28 and 256.76 gm/cc for soyblended flakes from wheat, sorghum and maize. Cost of operation worked out to Rs. 40/q of product. The nutritional value and physical properties of the snacks were found to be satisfactory.

Low Cost Wet Grinder for Soybean.

Patil R.T. & Nawab Ali.
December, 1989.
General.

In this paper the authors described about Wet Grinder which they have developed in the Institute. The author has discussed about the performance of wet grinder and discussed about the economics of operation and applications of wet grinder.

Analysis of Problems Faced During Extrusion Cooking on a Low Capacity Indigenous extruder.

Chattopadhyaya P.K., R.K. Mukherjee, P.C. Bargale & Jaswant Singh.
December, 1989.
General.

A study was conducted to evaluate the performance of low capacity indigenous extruder. Various feed rates (6,8,10 kg/h) moisture contents (20,24,28,32%), cooking temperature (145, 150, 155° C) pressure (25,35, kg/cm) and screw speed (60,70,80 rpm) were attempted for extrusion cooking. The optimum operative conditions were 8 kg/h feed rate, 28% m.c. (wb), 150° C cooking temperature, 35 kg/cm pressure, and screw speed of 60 rpm. The processing cost was Re 0.74 per kg of extruded product. During the study problems were faced on account of mechanical and operational shortcoming. These problems have been analysed and suitable remedies suggested.

To Evolve Simple and Cheap Technique for Slurry Utilization. What is Development?

Srivastava H.C.
Sept. Dec., 1984.
General.

Benefits accruing from the GNP-obsessed growth models, and planning patterns based on the 'Trickle down Theory' and highly sophisticated technology, have not

percolated downwards to the masses at the lowest rung of the society. Industrialisation, mechanisation and centralisation move together in a vicious circle and have ultimately resulted in accumulation of wealth in the hands of a few, extinction of traditional local industries, and thus impoverishment of the bottom majority at the grass-roots. In the background of these observations, the author has critically examined the body-politic, the scum of the society, which is in league with enslaved planning process, bureaucracy and professionalism. He has, further, stated that the environment and ecology should be regenerative through the development action, otherwise the life support system will deteriorate and reach a point of irreversibility.

Pains, But Little Growth.

Kapoor R.N.

December 1987.

General.

How can the farmer survive or grow? When more than 80% loans & advances are given to the industrial sectors while in developed countries, the resources are being diverted from Industry to agriculture. In fact no planning system exists to correctly assess the needs of villages no security is provided for farmer & the scheme which are being run on the names of the poor infact the beneficiaries are the others. These are the reasons this 75% population of the rural areas are resting towards the Urban areas for the search of other jobs which are none search their the agriculture.

Management of the Non-Organised Sector: Models and Strategies for Development of the Mixed Economy Country.

Ramaswamy N.S.

June, 1989.

General.

It is well recognised that science and technology exert an increasing influence on growth and development-material, industrial, economic and social. For any activity of organised or non-organised sector management is essential to define goals and tasks in operational terms: To build linkages and decide on deployment and utilisation of material and human resources, in order to achieve the agreed tasks. The country today is in a crisis in which everybody has to give up something. According to the author the management professional should move toward modernisation of the non-organised sectors with the help of their major instrument, namely formal organisations.

Diffusion of Saffron in Kashmir and its Impact on Rural Economy.

Rufai S.S.A.
March, 1988.
General.

Surveys to trace areal sprawland production pattern of saffron in Kashmir valley have revealed that saffron cultivation is much more remunerative than other crops grown in the area. The author on basis of such data asserts that the socio-economic condition of the rural people of the area, most of whom derive their livelihood from agriculture, can be raised by diffusing saffron throughout the valley. The author is of the idea that more than three fourths of the area can be converted into saffron cultivation, as the area to this extent has favourable conditions for its diffusion.

Textile Technology as a Subject in German Schools.

El-Gebali Traute
March, 1986
General.

Textile Technology is based in two main fields, chatting and dwelling. The article throws light on the reception, production, consumption, communication and aesthetics aspects of Textile Technology. The writer elucidates the main objectives of the subject, methods of teaching and learning as also the problems that are faced in a changing and developing society.

Deadly Development.

Alvares Claude.
March, 1986.
General.

Societies have found themselves placed either on one side or the other of a development spectrum. The attack on development should be seen as an attack on a system that is harmful to the earth in all its dimensions. The advanced societies are exhausting their resources at break-neck speed and are attempting through multi-national and financial institution, to control the resources of others. The poor, however, will not give in this line without fighting. Discussing the development spectrum the author in this article speculates that unless the case against development is taken up in earnest the elite will solve it in the manner they have always preferred, at the expense of the rest.

HEALTH**The Silent Pains of Rural Women in India with Special Reference to Health Risks.**

Srivastava J.C.

September, 1991.

Health.

In the rural areas of developing countries, women constitutes nearly 50 percent of the population and form a visible majority among the poor. Women work not only in their homes and on their farms, but also as wage earner working on others farms and undertaking co-farm and non-farm occupations. In addition, they generally serve as fuel, fodder and water carriers for their families and this involves daily average of tiresome distances with heavy loads on the body for long hours of the day. In all they undertake 10-12 hours of hard physical labour. The women are on the other hand, unduly vulnerable to many health risks, problems and hazards in performing these tasks. Continuous hard work on the farm causes muscle fatigue and strain which does not allow them to recoup their strength or to build-up their defence mechanism. The Socio-economic conditions of women compel them to take-up occupations which are often hazardous. The paper presents a broad picture of domestic, farm and co-farm occupations having larger participation of rural women in India, posing serious, persistent and dominant health problems of toxicological and ergonomic nature and the resultant pains and sufferings.

PLANTATION**Potential of Cut Flowers and Ornamental Plants for Internal and External Markets.**

Singh J.P., Md. H. Kabir and S.R. Singh.

December, 1990.

Plantation

Commercial floriculture in India is still in developing phase. Considerable amount of work has been done in last decade and at present area under commercial floriculture is approximately 20,500 hectares with an annual transaction of Rs. 100.00 crores. Demand for cut flowers and live plants is increasing day by day. This paper throws some light on present position and future line of action of commercial floriculture alongwith its by products. A sincere, regulated and organized assests has to be made to make this industry a viable one.

RESEARCH & DEVELOPMENT**Need & Management of Science & Technology for the Development of Women.**

Swarup Janardan.

December, 1985.

R&D

Women work in agriculture and industries for many, if not more, hours as their male counterparts. Yet their hour labour is counted as 'shadow work' giving them neither due credit nor adequate cash compensation. As women cannot leave their homes for a long time to work in factory or farm their economic independence requires the kind of occupations which can be managed along with the household chores which they have to look after. The author suggest that it is the right time that the scientist, technologist and policy makers apply their minds and try to promote develop and transfer technologies appropriate to women folk.

Towards Meaningful Research.

Dr. A.N. Pathak & Major S.C. Mathur.

December, 1986

R&D

Now-a-days the trend of research is to investigate some phenomenon, never before researched. This means that the conduct of S & T and its application tends towards that which is existing and now rather than what is practical and relevant. The author suggests in the article that an attempt has been made to bring out the existing short comings in the R & D efforts at a down to earth level to make it more practicable and meaningful.

RURAL HOUSING**No Match To Treated Thatch**

Gopalkrishna R.

June, 1988.

R.Housing.

Chemically treated thatches can be used effectively for low cost roofing. This thatch has four times longer life than untreated thatches. Treating method, material requirement and cost analysis have been described in the present paper.

Long Span Palm Timber Roof Truss.

Das R.N.

June, 1988.

R.Housing.

For spans greater than 5 m, design of Palm Timber Roof Truss for inclined roof construction in rural areas has been suggested. The roof of a typical school building having a floor dimension of 8.05 m x 18.3 m with Raniganj tiles as the covering material and supported by five Palm Timber Roof Trusses of different frame patterns has been presented in this paper. Appreciable reduction in the cost of roofing due to the use of palm timber as the basic structural material and Appropriate Technology in the installation and handling of the trusses have resulted in a low plinth area cost of Rs. 25/sq.ft. (Rs. 271/sq metre) for the school building, which was completed in April 1986.

The Search for Low-Cost Construction (Reproduced from the Urban Edge, (A Word Bank Journal).

Sept. Dec., 1984

R.Housing.

It is a well known fact that housing conditions in the majority of the developing nations are deteriorating despite attempts at improvements by voluntary/governmental agencies. Low-cost housing schemes are primary necessities for the vast rural poor. Much research and developmental activities are to be carried on in the search for low-cost housing constructional materials and installations. In view of the urgent necessity of replacing the already existing slums and substandard dwellings in the rural and urban areas of the developing nations. RTJ is reproducing the present article from the Urban Edge*, a world Bank journal.

Stiffness Characteristics of Loaded Palm Timber Roof Truss.

Das R.N.

March, 1989.

R.Housing.

Deflection at midpoint of central lower chord of five Palm Timber Roof Trusses of different frame types were measured. Observation of these deflections over a period of eighteen months revealed that Modified Queen-Post Truss sags the minimum ($1/650$ th of the span) under the specified loading condition. Spacing of the trusses was 3.04 m (10 ft.) centre to centre and span 8.072 m (26.5 ft.) with Raniganj earthen tiles as the roof

covering material. For spans in the range of 5 m to 10 m, Modified Queen- Post truss is recommended for inclined roofs of Palm Timber as this gives the maximum stiffness.

Making Mud Houses More Durable and Livable in Rural India.

Srivastava J.C.

June, 1986.

R.Housing.

A vast majority of people in rural communities live in houses made of mud walls and thatch roof. Such walls are susceptible to damage due to rains and floods and require frequent repairs; similarly, the thatch roof has to be frequently replaced due to decay and it is also vulnerable to fire. Such mud houses will continue to exist in rural areas especially with the poor because of tradition, climatic and economic conditions and want of affordable better housing. Technologies for protecting mud walls and extending the service life of thatch roof while minimising fire hazard and decay have been developed by the Council of Scientific & Industrial Research of India and are being widely propagated. The case study presents the experience of transfer of these technologies to areas especially among the poor communities. It has been noted that unless the people are hardpressed or compelled due to circumstances, they are not willing to invest in the application of these technologies. However, these technologies have been successfully implemented through the government sector under the rehabilitation or rural development schemes for providing houses for the landless and the weaker sections of rural society.

Rural Housing: Problems and Prospects.

Ahuja T.D.

December, 1985.

R.Housing.

Housing is one of the basic needs of people. However, provision of suitable shelters, to under-privileged millions, has been one of the most serious problem in most areas of the world, especially in developing countries.. The author states that number of rural houses have increased but not in conformity with the growth of population and rural environment.

Housing for the Rural Masses-Present Trends an Analytical Approach.

M. Madan, Deshpande V.B. & Rampal, S.K.

March, 1989.

R.Housing.

Majority of the Indian population live in rural areas. But due to low level of construction activity and poor economy, no commercial housing entrepreneurship exists

in rural areas. Realizing the importance to improve the living condition of majority, Government is paying and more attention towards this problems. In the present article the author highlights every aspect and options of low cost housing from planning, design to material and construction labour which are effective factors in cost control.

Promising Roofing Technology for Rural Poors of the Coastal Region of the India: Treated Thatches.

Gupta Mohan Lal.

December, 1989.

R.Housing.

The paper deals with different types of roofing material which are useful to poor people and applied in rural areas of coastal region. The author has discussed about various chemical treatments of thatches which enhances the life of thatches.

Housing the Rural Poor.

Yadav H.K.

June, 1988.

R.Housing.

Shelter is one of the important basic needs. The housing problem of India is increasing day by day. We can boast of flurry of activity in this regard. Special schemes have been set up, commissions appointed and new strategies chalked out. But all this is far away from the hard realities of life for the homeless who continue to live in the grimmest environment. To meet out the worsening crisis as highlighted by author-due emphasis should be give to housing finance, use of appropriates techniques, locally available materials, the role of NGO's/Voluntary agencies.

Development of Suitable and Economical Housing System for Dairy Animals.

Srivastava P.K., & P.C. Bargale.

June, 1989.

R.Housing.

Housing facilities to animals have been ignored by Indian dairy man and farmers for want of a scientifically designed low- cost animal shelter. A technically viable and economically feasible animal shed was therefore designed and developed using locally available construction materials. The performance of this shed was evaluated in terms

of maximum and minimum temperatures and Relative Humidities (RH) during the peak seasons of hot/cold stress and precipitation. The results were compared with ambient and that of a similar shed with ACC sheet roof (in place of country tiles). The paper presents a brief discussion on the design aspects, materials of construction, economics and the performance of two sheds.

Rural Housing-An Ideology.

Ahuja T.D.

Sept./Dec., 1984.

R.Housing.

In this illuminating article, improved characteristics and techniques in the sphere of planning, specifications and building materials have been briefly demonstrated, within the range of socio-cultural adaptability, economic viability, geo-physical suitability and environmental compatibility. The author has shown that most existing rural houses which are generally ill-planned, ill-ventilated and insanitary can be improved a lot with a minimum of investment. He has also shown that it is possible to vastly improve the performance of traditional building materials by minimum input of modern materials or techniques and thus the durability of rural houses can be substantially increased by stabilising the structures.

Palm Timber as a Structural Material.

Das R.N.

March, 1990.

R.Housing

Specific Weight, Modulus of Elasticity and ultimate Strength in Tension, Compression and Edge Shear of Palm and other common structural wood, namely, Sal, Sesame and Teak have been experimentally found and reported in this paper. These values have been compared with well-known varieties of structural timbers of Europe and America. Palm timber has been observed to be the strongest of all the Indian varieties and compares favourably with other structural wood of the world, yet costwise it is the cheapest. The traditional practice of using Palm for structural and other purposes in the rural areas of our country needs to be further encouraged as in addition to boosting rural economy it maintains the ecological balance as well.

Rammed Earth Walls for Houses of the Rural Poor

Swamy Mahadeva

March'1993

R.Housing

House is one of the basic necessity of Human being therefore, it should be well within the reach of even poorer class of society. It is possible by developing low cost, less energy conserving strong and durable materials which can be used as construction material for walls. In this paper author had given techno-economic comparison of different types burnt, non burnt bricks with Rammed Earth Walls for houses and details of preparation of rammed earth walls.

RURAL INDUSTRY**Hank Mercerising Machine.**

Kannakumar R., K. Sundaresan & K. Jayachandran.

March, 1992.

R.Industry

Mercerisation is an important finishing process for cotton that improves lusture, hygroscopicity, strength and dyeability. This paper deals with the design and fabrication of a low cost hand operated hank mercerising machine suitable for Handloom weaving industry. It also deals with the economics of the machine and gives the machine fabrication details.

Tiny Cottonseed Complex.

Desai V.K.

March, 1986

R.Industry

Some of the problems regarding one of the most important crop cotton, is dealt with in this article. Entire industrial processing from kapas to ginning, oil milling, refining is carried out in big factories in cities and towns, and our planning, Government policies, bank financing etc. support and sustain the whole structure which is basically exploitative to villages. In this picture villages are nowhere. This article is an eye opener to the fact that villages can be benefitted by the crop grown in their midst rather than have the benefits and various advantages drained to the cities.

Technologies for Indian Rural Leather Sector.

Gupta K.B., J.K. Khanna, K.S. Jayaraman.

June, 1990.

R.Industry

The authors gives an illustrative account of a very effective extension programme, of the Central Leather Institute, Madras. It is an interesting example of how improved level technology can augment employment potential in villages, enhance the socio-economics of artisans engaged in leather trade. It also highlights the great potential of processing of hider and skins in the rural sector and therby contribute to overall development of villages.

Manufacture of Country Tiles from Red/Black Soils of Phulbani District (Orissa).

Bhatnagar J.M., R.B. Hajela and R.K. Goel.

Sept., 1990.

R.Industry

The demand for cheap and durable roof covering materials has considerably increased in rural, tribal and adivasi areas of orissa state in particular. Half round clay country roofing tiles fig1 are one of the most widely used roof covering material in this state. Other roof covering materials used in EWS housing in the region are leaves, thatch, bamboo reeds etc. Quality of burnt clay products as tiles, bricks etc. being manufactured in the area are far from satisfaction, showing poor strength and durability. In view of the increasing demand of suitable roofing materials for various housing scheme being undertaken for rural and adivasi inhabitants of Orissa, Phulbani Rural Development and Technology Agency (PRDATA), G.Udayagiri (Phulbani) under the financial support of CAPART requested CBRI to provide package technology for small scale production of cheap and improved quality roofing tiles and for use in various blocks of Phulbani District. Investigation were therefore undertaken to locate suitable soil deposits for the manufacture of country tiles, to develop and demonstrate suitable process technology for country tiles manufacture, impart training to adivasi and artisans so that the poor masses could manufacture then for their use on self help basis. Results of these investigations and process demonstration for manufacturing country tiles, test data on fired product.Details of quality control measures etc are discussed in the paper.

Microbial Retting of 'Munj' Fibres from Saccharum Munja an Agro-waste.

Gujral G.S. & P. Vasudevan.

March, 1987.

R.Industry

The munj fibers separated by microbial retting are comparable with those separated by traditional method of beating. This method if carried out on larger scale, could help in alleviating the drud gery involved in fibre extraction.

Strategy for Development of Khadi, Village, Small and Tiny Industries.

Kapoor R.N.

December, 1985.

R.Industry

Agriculture without being reinforced by rural industries will not be able to sustain the rural economy because agriculture alone is not adequate to absorb the rural work force. As a result, the rural unemployment has grown unabated, village crafts and skills have been almost wiped out and standard of living of majority of the village community has declined to a miserable state of poverty. The author highlights the urgent necessity for developing village, small and tiny industries to absorb growing mass of rural unemployed and under employed and thereby provide a better quality of life to them.

Portable Hand Operated Pirn Winder

Kumar R. Kanna, K. Sundaresan, N. Ambumani & Prof. K.jayachandran

June'1992

R. Industry

This paper deals with the design and fabrication of a Portable Hand Operated Pirn Winder suitable for handloom weaving industry. The design, and development of the pirn winder are dealt with. The paper also describes the material requirement, details of assembly and performance evaluation of the machine.

Automatic Negative Let-Off Mechanism for Handloom.

Venkatachalam A., K. Sundaresan and K. Jayachandran.

March, 1992.

R.Industry

In Handloom Weaving uniformity of pick spacing is most important. For, such variations can produce visible, fault in fabrics. The uniformity of pick spacing depends

upon the type of let-off mechanism employed in the Handloom. The present paper deals with the modification of the ordinary negative let-off mechanism in a handloom into Automatically controlled negative let-off mechanism, which can exercise a good control over pick/inch spacing. It is found that the cloth woven from the handloom fitted with automatic let-off mechanism has less variation in picks and the general appearance of the cloth is also better than that woven with ordinary negative let-off system.

Village Industries Movement.

Anandi K.S.

Sept.Dec.,1984.

R.Industry

Simple living and high thinking- the noble teaching of the Mahatma is being increasingly realised to be the best for a happy living. The prodigals that we are, have, however, come round to see the writings on the wall that is through the development of smaller units of production and simple technology alone the idea can be translated into reality.

Small Scale Industry-Problems and their Solution.

Swaroop Janardan.

September,1988

R.Industry

The characteristics of small enterprises dovetail well with the socio economic objectives of the developing countries. Generally, they are labour intensive, employment generating, capital saving, and capable of operation on a decentralised basis in rural areas. A common problem with small entrepreneurs in India is the lack of advice on choice of product and assistance with selection and adaptation of technology. As a consequence production of sophisticated products is ruled out for most small firms because of lack of R & D facilities, and promotional measures relating to the acquisition of raw materials, subsidised inputs are of limited use to a small firm competing in a market which because of ease of entry, is already flooded by other small firms. The author also suggests the possible solution of these problems in this paper.

Tiny Oil Mill.

Desai V.K.

Sept.Dec.,1984.

R.Industry

About 300,000 families running oil ghanis, have lost their livelihood due to the emergence of big oil mills in the name of industrialisation with advent of industrial age

after independence. Centralisation in edible oil industry have led to a situation in which a handful of industrialists are selling inferior and adulterated oil and are earning millions of rupees, at the cost and deprivation of many. In the present article Sri Desai discusses in nutshell the possibility of decentralisation in edible oil industry, alongwith the establishment of 100,000 tiny oil mills in villages. He clearly depicts that by the introduction of a tiny oil mill in a village, benefits will be distributed among oil miller, farmers and customers - resulting in ultimate prosperity in that village.

Punching Technology : An Agro-Process Model & Home Based Industry

Sharma P.D., S.C. Jain & C.K. Teckchandann

September, 1993

R. Industry

A punching machine developed by authors under Post Harvest Technology Scheme at J.N.K.V.V., Jabalpur, can be used as agro based model or home industry to earn profit by the farmers. This technology of punching not only reduces the cooking time & energy but also improves the cooking quality & taste of the whole pulses. This paper deals with the cost economics of the technology, when used as home industry. A farmer by using this technology as home based industry may earn about Rs. 7000-8000/- against the work of one month for pea-punching and dehydration only.

RURAL DEVELOPMENT

Role of Community Polytechnic in Rural Development.

Chakravarty A.

June, 1984.

Rural Dev.

Technology responds to social wants, which are in turn modified and transformed by technology. Since social wants are not static, the products and services that are produced create new social wants and the interaction continues. The Polytechnics can provide vital elements for rural development in an organised manner, either from their own resources or with the help and collaboration of other technological institutions. The writer in the following article throws light in the function of community polytechnics in Rural Development.

People's Participation in Rural Development: Project Identification, Formulation and Implementation.

Prasad R.N.

March, 1986.

Rural Dev.

A project is a statement of purpose, in which the planner mentions the objectives or targets he wants to achieve. The objectives or targets are derived through socio-economic study to identify the needs, marketing possibilities and available opportunities. The writer discusses in detail how peoples participation in rural development project can be achieved only when it can be designed and implemented from the beginning.

Gandhian Strategy for Rural Development.

Mathur J.S.

June, 1987.

Rural Dev.

For socio-economic upliftment of rural masses Gandhiji advocated revival of cottage and village industries in India's Villages. Cottage and village industries of Gandhiji's definition will not be prototypes of the western variety catering far markets for and wide but those that will be meeting the felt needs of the village inhabitants. Therefore we have to concentrate on the village- being self contained-manufacturing mainly for use.

Rural Development and the Ruling Elite.

Shanker Kripa.

April June, 1985

Rural Dev.

Almost three percent of the rural population own more than one fourth of the land, These groups with their money, power and influence, succeed in controlling directly and indirectly the various organs of power and institutions like Gram Panchayat Cooperatives, Block Samitis etc. An egalitarian structure is of prime importance towards the reorganisation of village life. The author also suggests drastic redistribution of load to put an end to the hegemony of the rural domination classes.

Classification, Methods of Construction and Financing the Rural Roads-Some Issues and Suggestions.

Singla P.K.

September, 1991.

Rural Dev.

In this paper brief introduction, design aspects and methods of construction of rural roads has been described. The various financial resources and suggestions has given. The author has considered the economic aspect of construction of various types of roads.

Voluntary Organisation in Promoting Science and Technology in Rural Development.

Kapoor R.N.

December, 1990.

Rural Dev.

Unemployment, rural poverty and ecological disbalance have assumed ominous dimensions all over the world. Of course the government has taken up the responsibility of solving the major problems like poverty, unemployment and inequalities. So far as India is concerned the direction of growth is as important as the rate of growth. But, experience tells us that a purely bureaucratic approach is not going to achieve the growth of required order. Perhaps only voluntary agencies can do a recommendable job in certain areas because the strength of Voluntry Agencies lies in their capacity to understand local needs, problems and resources; to involve local people and secure their cooperation and participation; and their desire to experiment with new programmes with their experience of their rich heritage as highlighted by the enlightened author, The paper very efficiently advocates the need of "Land of Lab" innovation process to overcome the growing range of problems.

Technology For Rural Development in Jaisalmer District of Western Rajasthan

Mertia R.s. & J. Venkateswarlu

December 1992

Rural Dev.

The authors has discussed about the various problems of Jaisalmer district of Western Rajasthan like wind erosion, grassland improvement and utilization and their control, soil water conservation measures. They have also specified the various species,

fruit crops and suggested economic plants which are helpful in control of wind erosion, improvement of glassland. Lastly they have discussed about irrigation mangement and technology transfer programmes in Jaisalmer district of Rajasthan.

Area Development Plan

Singla P.K., Rajesh Patel & Poonam Syal

March'1993

Rural Dev.

The paper gives an idea about area development plan, various steps of preparing the area development plan. The author has also discussed about various problems which one has to face in preparing area development plan.

Rural Development Model Based on Integrated Energy Systems - A Case Study of Successful Story

Maheshwari R.C., R.singh, Harpal Singh, C.P. Bohra & K.C. Pandey

September'93

Rural Dev.

In this paper the authors has discussed about rural development model based on integrated system. This system was developed and implemented in Islamnagar village Distt. Bhopal. They have shown the steps through which this model was implemented.

SANITATION

Issues on Involvement of Women in Rural Water Supply and Sanitation for 'Health For All'.

Srivastava J.C.

Dec., 1990

Sanitation

The article gives a broad overview of the key issues of S&T Mission on drinking water and the role of rural women in its implementation . It also gives a short narrative of the strategy and the pilot project formulated for action study. At the end it provides quite a comprehensive bibliography on women, water and sanitation in developing countries, which it is expected, will be of practical value to researchers, implementors and field workers alike.

Water Quality Monitoring Management In Rural Areas

Srivastava Dr. J.C.

June'1993

Sanitation

This paper presents concepts and approaches, innovated by the National Drinking Water Mission of the Government of India for water quality monitoring (WQM), surveillance, and their management in its overall Rural Water Supply and Sanitation (RWSS) Programme.

" Thapoly Latrine" A Cheap & Dependable Sanitary gadget for the Rural Poor.

Rajput R.K.

June, 1984.

Sanitation

A number of diseases which first develop and then spread out. Sometimes in epidemic form, are largely due to in-sanitary conditions prevalent in our area and this is more pronounced particularly in villages where poor sanitary conditions prevail. The various advantages of Thapoly latrine is explained by the writer in this article. He informs that Thapoly latrines is such a sanitation unit which can be easily afforded by the rural poor. This unit can prove to be a source of comfort and an asset for improving sanitation of village as a whole.

Role of Voluntary Organisation in the Field of Low Cost Sanitation.

Patel Ishwarbhai.

September 1990.

Sanitation

The space requirement to dump the waste product and disposal of human excreta is a very common problem for the third world countries. India in particular is facing this problem in a big way. Pathogenic organisms, foul odour and other harmful vectors arising out of decaying wastes, garbage and human excreta pose serious threat to the environment and human health. If these wastes are in some way converted into energy and other useful products/ by products it will be eminently beneficial from economic, environmental and many other considerations. The article highlights the pioneering role played by Safai Vidyalyaya of Ahmedabad in extension, education and training of techniques for on-site disposal of human wastes, conversion to latrines of pour- flush type etc.

Prevention of Environment Through Low Cost Sanitation.

Pathak Bindeshwar.

December, 1989.

Sanitation

The various aspects of environmental pollution caused due to transportation of human excreta has been discussed in this paper. The author has suggested about low cost on site disposal system and water seal flush latrine as a solution in the pollution problems.

SOLAR ENERGY**Development of Tray Type Ultra violet Stabilized Plastic sheet Covered Solar Cabinet Dryer for Rural Areas.**

Jain S.K.

December, 1991.

Solar Energy

The design details and performance of 200 micron ultra violet stabilized plastic sheet covered tray type solar cabinet dryer which can be used for dehydrating 50 kg of fruits and vegetables are described in this paper. The cabinet temperatures of 34 to 55°C were recorded at Udaipur during the coldest days in the month of December. The field tests indicated that by the use of this dryer, the moisture content of ginger can be reduced from 84 percent to 10 percent within 5 to 6 days. The efficiency of this dryer is about 15 percent. This dryer can be used for dehydrating fruits and vegetables of rural areas where primary processing operations are almost absent.

A New Paint for Solar Cooker

Srivastava S.K., Anoop Gaur, O.P. Singh & R.S. Nirjar

June'1992

Solar Energy

Effect of Mat Black paint and a mixture of Mat Black paint and apexior No. 3 has been studied. A mixture with ratio 1:1 may be considered a suitable paint for box type solar cooker.

Solar Energy For Garlic Dehydration

Jain N.k. Jain & Jabar Singh

December'1992

Solar Energy

Peeled garlic cloves were dehydrated in open sun, direct type and indirect type solar dryers. Equations were developed to express the relationship of moisture content versus time and drying rate versus time. About 160 to 280 percent reduction in drying time was observed with direct type solar dryer over other methods, thereby resulting in low operational cost and high out turn. Direct type solar dryer was found suitable for dehydration of garlic considering various quality parameters viz. volumetric shrinkage, rehydration ratio, coefficient of restoration, colour and flavour score.

Performance of Photovoltaic (PV) Lighting Systems

Srivastava S.K., A. Gaur & O.P. Singh

March'1993

Solar Energy

As per survey on PV systems installed in Uttar Pradesh, it has been observed that about 75 percent of defective systems were unfunctional due to problem with the storage battery. To reduce the problem of sulphation and self discharging rate 10 gm phosphoric acid per litre of electrolyte may be added. For the effective maintenance of lead-acid batteries, suggestions made in this paper should be strictly implemented.

Instructions for the use of Box Type Solar Cooker.

Vaithilingam G.

June, 1984.

Solar Energy

If a solar cooker is properly designed and used, it is possible to cook food daily for a family of five for about 250 day in a year. The writer in this article explains in detail the method to use a Solar cooker, the cooking technology in India, advantages of a solar cooker and various precautions taken for cooking with solar cookers.

Fresnel Solar Cooker (F.S.C.).

Fatangare N.M.

March, 1992.

Solar Energy

Different types of solar cookers viz. Box type, Box type with single reflecting mirror, paraboloid concentrating type etc. are being used. Box type solar cookers are in

wide use, which can give the temperature upto 140°C depending upto the solar insolation. This temperature is insufficient for cooking of some hard material like dal and consumes much more time for cooking. The attempt has been made to fabricate a solar cooker using Fresnellens to avoid above difficulties. This cooker gives comparatively high temperature up to 193°C and saves the cooking time. It requires tracking for every 15 minutes.

Design and Thermal Simulation of a Solar Passive House for Ladakh Region.

Prakash Sanjay, I.C. Goyal, Arvind Goyal, R.L.Sahney & M.S.Sodha.

June, 1988.

Solar Energy

Ladakh is one of the most remote and rugged inhabited cold desert region of Himalayas. The climate of the region is very harsh : (very cold, very dry and very sunny). The average minimum temperature during winters is 15°C (it may even touch -40°C at certain locations). The region (for its clear sky conditions for the larger part of the year about 300 clear day/year), receives sunshine in abundance (215° kwh/year) and hence has a very large potential of solar enrgy applications. Under one of the projects from DNES, the Solar Thermal Group of IIT Delhi is designing solar passive buildings for different income groups. Using modified fourier admittance method, the thermal performance of these designs is being checked by computer simulation. This paper presents design and results of thermal simulation of a building designed for middle income group. It is seen that with the proper combination of various solar passive concepts and proper distribution of thermal storage in the building, temperatures upto $+16^{\circ}\text{C}$ can be achieved in the main living spaces.

Small Solar Ponds for the Tropics.

Srinivasan J.

June, 1991.

Solar Energy

The performance of a small solar pond at the Indian institute of Science is discussed. It is argued that small solar ponds are suitable for the tropics to meet the process heat requirements of hatcheries, diaries and silk filatures. The use of a submerged copper heat exchanger is recommended because of its high effectiveness and low maintenance needs. A novel passive salt replenishment method is described and shown to work successfully in small solar ponds. The effect of size and shape of the pond on the performance of small solar ponds is discussed.

Performance Study of Small Solar Dryers.

Hossain -Md. Anwar & S.M. Rahmatullah.

April-June, 1985

Solar Energy

Two direct type small solar dryers, one made of bamboo and the other of wood, were fabricated and tested at the Bangladesh University of Engineering and Technology, Dhaka in the months of September and October. The dryers were loaded with paddy and the results were compared with those obtained by the age-old traditional method of open exposure to the sun. At this stage of development, the bamboo dryer appears to be the best from the point of view of both, moisture removal rate and cost.

TECHNOLOGY TRANSFER**Delivery System for Transfer of Technologies to the Rural Poors.**

Rao A.Rama.

March, 1985.

Tech. Transfer

We are in an age of constant change. It is occurring at such a fast pace that new methods are needed to adapt the changes, innovation is a deliberate planned change to improve a system or accomplish an objective. Technology and Technology Transfer are tools of innovation that are used to help bring about a change. The promotion and dissemination of technology to rural areas can be achieved successfully through an effective delivery system by arranging exhibition-cum-demonstration at district and block-level is dealt briefly in this paper.

A New Model for Technology Transfer to Villages.

Soudararajan P. & Rajeshwar Dayal.

March, 1985.

Tech. Transfer

If science and technology is to be of any value in India, it must be able to help the poor and it should fit in the socio-economic matrix of a given habitat and be offered in a form that would be acceptable and understood. A multi-tier integrated approach has been adopted to include the essential elements of the innovation chain such as development of technology, demonstration of process technologies under actual field

conditions, training of artisans and skilled workers preparation of technology manuals in simple local lingo etc. Since, an intergrated approach is followed in the planning and implementation of this programme with proper linkages with R & D institutions, government departments, voluntary agencies and the village level officials, it is expected that not only this would be an effective pipe line from the laboratory to land but also from the land to lab.

Linkers for Rural Technology Transfer.

Agarwal Rekha.
December, 1985.
Tech. Transfer

Jolly developed a predictive model for the coupling of the source of knowledge with utilizer of knowledge. He listed nine factors, four formal and five in-formal, which affect the transfer of technology. At this point significant validating research has been conducted on the "Linker" factor. The linker concept is dealt in an interesting manner in this thought provoking article.

A New Approach to the Understanding and to the Transfer of Technology.

Rehling Uwe.
September, 1986
Tech. Transfer

This article highlights in a most forthright manner, the banes of centralised technologies, industrialisation and the so called development aid, the dynamics of socio political forces in choice of technology and thereby influencing the process of socio-economic development in the favour of elites in nation states and between the nations. The author gives a brilliant elucidation of the historical growth of civilisation with special reference to interplay of technology in this process and its various facts. With the above background, and looking to the realities of the rural third world, the author highlights the relevance of technology pedagogics and if scientifically pursued what succour it can bring to the disposessed and the underprivileged amongst the developing countries and towards a saner society in the 'developed' ones.

Technology for Rural Development: 'Utilisation of Animal Energy and Development of Improved Carts'.

Naik V.A.P.
December, 1985.
Tech. Transfer

Animals have always played an important role in the economy of our country, so much so that cows who provide milk and bullocks who provide draught power for

agricultural operations and transport, have been worshipped. It is the time now to revive our interest in our lost animal power which in the event of a serious energy crisis can provide decentralised and ecologically sound means of power and energy in every village. The author also emphasises the development of "Improved carts" which still has a tremendous potential to augment the rural economy.

POLLUTION

Water Pollution- The Greatest Constraints for Development of Tomorrow.

Lahiry Partho Protim.

June, 1989.

Pollution

Water pollution is the major environmental problem associated with population explosion and urbanisation. Availability of clean water has become the greatest constraints for development. In the present paper, author has elaborated the causes of water pollution, simultaneously he has emphasised the measures for restricting pollution.

Role Of Voluntary Organisations In Protection of Water Bodies from Pollution

Srivastava Dr. J.C.

September'1992

Pollution

The voluntary agencies (V A) have been working in socio- economic development programmes including the field of providing safe drinking water and sanitation facilities in villages. In doing so, some of them have developed expertise and professional competence to carry out a variety of technical services. The VII Five Year Plan has emphasised on involving V As in development and promotional activities, and accordingly defined their role. The V As were also involved in the National Drinking Water Mission (NDWM) of the Government of India. Hence, the involvement of these agencies and NGOs in the programme of pollution abatement in water bodies, has much relevance in achieving the environmental and health objectives. This subject, however, needs to be related with the definition of overall activities involved, roles and responsibilities of participating institutions and government agencies, and the expectations from VA/NGOs. The paper discusses these aspects for exchange of views.

Water Resources Development and Management.

Mittal S.P.

March, 1991.

Pollution

The paper reveals about the present water resources and how the inefficient management leads to drought in some areas and floods in other areas. An experimental study about village Sukhomajiri has also been discussed. It also elaborates a strategy for proper management of soil and water resources.

WIND ENERGY**Windpump Manufacturing & Application - The Indian Experience.**

Srivastava H.C.

December, 1988.

Wind.

Wayback in 1980, the Institute of Engineering & Rural Technology, Allahabad, India, identified the potential of low windpumps for micro-irrigation in the Gangetic plains and later in other regions. Followed by this, through the cooperation of the Department of Non-Conventional Energy Sources, Govt. of India, an ambitious local production of Windpumps was initiated through which nearly 1000 Windpumps were installed throughout the country. Applications as diverse as micro-irrigation to bring pumping for salt-production were adopted, and varied experience gained, which constituted a sound basis for future proliferation of this technology.

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