ABSTRACTS

National Seminar on
Integrated Rural Development and Management: Issues, Strategies and Policy Options

17-18 December, 2010, Kolkata, India

Integrated Rural Development and Management (IRDM) Faculty Centre
Ramakrishna Mission Vivekananda University
Ramakrishna Mission Ashrama, Narendrapur, Kolkata-700103
West Bengal, India

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Organized by
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Ramakrishna Mission Ashrama, Narendrapur, Kolkata-700103
West Bengal, India

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RAMAKRISHNA MISSION VIVEKANANDA UNIVERSITY
(Declared by Government of India under Section 3 of UGC Act)
PO Belur Math, Dist Howrah, West Bengal 711 202, India

Foreword by the Vice Chancellor

Swami Vivekananda envisioned a unique type of University that would harmoniously blend the best elements of the East and the West-the Eastern spiritual and philosophical wisdom probing the inner world of Consciousness with the Western scientific and technological knowledge investigating into the outer world of matter. He always emphasized an integrated and holistic approach to Life and Reality. Ramakrishna Mission Vivekananda University, declared by the Ministry of Human Resource Development, Government of India, as an institution deemed to be a University under Section 3 of University Grants Commission Act, 1956, was inaugurated on 4 July 2005, the sacred day of mahasamadhi (passing away) of Swami Vivekananda, under the auspices of Ramakrishna Mission, the well-known philanthropic and charitable organization started by Swami Vivekananda, with roots in the hoary spiritual traditions of the age old Indian wisdom.

This University has initially chosen certain 'thrust areas' which are unique in that

(i) These areas scarcely receive any attention in conventional Universities in India,

(ii) These areas directly benefit the common man, particularly the underprivileged, the rural and tribal masses of India,

(iii) These areas are such that Ramakrishna Mission has developed enormous amount of expertise in them over the several decades or even a century so that education and research in these areas would be quite easy and effective.

Among these 'thrust areas', one of the most important is 'integrated rural and tribal development'. The University has two approved 'Off-campus' Centres devoted to this thrust area, one at Narendrapur, West Bengal and another at Ranchi, Jharkhand. Ramakrishna Mission Ashrama at Narendrapur, West Bengal, has become justly famous for pioneering work in integrated rural development over nearly three-quarters of a century. The University Faculty Centre devoted to 'Integrated Rural Development and Management (IRDM)' is located in this centre of Ramakrishna Mission and started functioning in 2006. This Centre is organizing a comprehensive National Seminar on the following major theme: 'Integrated Rural Development and Management: Issues, Strategies and Policy Options' for two days during 17-18 December 2010.

Swami Vivekananda was one of the greatest thinkers of our time who spoke extensively about the need for awakening of the rural masses, integrated development of the villages and education for women and the masses. His thoughts, spoken more than a century ago,

are still vibrant and relevant to modern India. With all our boast of modernization and keeping pace with the globalized world, our country will not achieve its goal unless the women and the rural masses are awakened to the benefits of education, health and all-round welfare, as Swami Vivekananda said. Since independence, our country has witnessed relentless experimentation with rural development and these efforts are manifested through a metamorphosis of intervention strategies and evolving institutional arrangements. Integrated Rural Development envisions all encompassing prosperity of rural communities and has come to be recognized as the only proposition for sustainable prosperity of rural India. Systems approach and systems thinking-what is now commonly called 'holistic approach'-both in theory and practices, is a precursor to integrated development. This idea has also been central to the Indian Philosophy. The present national seminar seeks to bring together the thoughts of experts-academicians, practitioners, rural administrators, etc-in an attempt to synthesize them to prepare a comprehensive blue-print to improve the health of the University curriculum in this important area. One added significance of this national event is its coinciding with the 150th Birth Anniversary Celebrations of Swami Vivekananda being planned all over India for four years from 2010 to 2014.

The present volume contains the abstracts of papers to be presented at the seminar. These abstracts are from over 87 educational and professional institutions spread over 5 countries. Contributions have come from as many as 20 states of India. Further, these abstracts cover a wide spectrum of subject areas related to the main theme of the seminar, like sustainable agriculture, women and child development, rural health and sanitation, education, institutional issues in rural development, the role of NGOs and Corporate Social Responsibility in rural development, rural management and human resources in rural development. We are sure that the interactions among all those who are seriously concerned about the theme of the seminar would not only help to enliven the proceedings, but also stimulate further thought leading to concrete action.

We acknowledge with gratitude the editorial support received from the members of the Editorial Board in the preparation of this volume.

Belur Headquarters of the University
10 December 2010

Swami Atmapriyananda
Vice Chancellor

RAMAKRISHNA MISSION ASHRAMA
NARENDRAPUR: KOLKATA-700103
(A Branch Centre of Ramakrishna Mission,
Belur Math, Howrah, West Bengal-711202)

Words from the Secretary, Ramakrishna Mission Ashrama, Narendrapur

I am delighted to know that the Faculty Centre for Integrated Rural Development and Management of Ramakrishna Mission Vivekananda University has taken the initiative to organize a national level seminar on 'Integrated Rural Development and Management: Issues, Strategies and Policy Options' during 17-18 December 2010 at the Ramakrishna Mission Ashrama, Narendrapur.

Organising the seminar is of national significance since nearly 70 percent of India's population lives in villages. And the villagers need a holistic and integrated development in their lives and livelihoods. Integrated thinking in contemplation and practices has always been central to the development thinking of Ramakrishna Mission. I hope that the national seminar will take stock of contemporary development thinking and practices in our country and will introduce in innovative strategies for sound development of rural India.

I sincerely pray for the success of the Seminar.

Swami Suparnananda

Narendrapur, Kolkata
10 December, 2010

(Swami Suparnananda)
SECRETARY

Faculty Centre for
INTEGRATED RURAL DEVELOPMENT & MANAGEMENT (IRDM)
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Message from the Dean

Rural development along with agriculture continues to be the fulcrum of planning and policy making in independent India. And we have experienced both technology driven and integrated approach in the history of our rural development. We, at the Ramakrishna Mission, have always believed in holistic and integrated way of development that envisages all aspects of human well-being. This will ask for appropriate technology, accessible services and infrastructure supported by a vibrant and innovative institutional arrangement at micro, meso and macro level. Continuous and progressive learning by all the stakeholders of development will be crucial for that. With this urge of sharing, Integrated Rural Development and Management Faculty Centre of Ramakrishna Mission Vivekananda University have arranged a national level seminar on 'Integrated Rural Development and Management: Issues, Strategies and Policy Options' during 17-18 December 2010 at the Ramakrishna Mission Ashrama, Narendrapur.

I hope that this event is going to be of national significance as academicians, scientists, researchers and professionals working in the broader area of rural development from all over the country are expected to participate in this national event to share their experience and exchange views. A cursory check of 157 abstracts suggests that the Seminar is going to have an exhaustive coverage of issues related to rural development. I am expecting a festival of intellectual exercise and organic interaction among the participants during the event.

I also take the opportunity to extend my heartfelt thanks to all the people who have been and will be with us during the seminar. I hope that the deliberations during the seminar will result into fruitful recommendations that will pave the way for improved rural development management in our country.

I convey my gratitude to all the persons who have paved the way to the success of this nationally important seminar.

Manas Ghosh

Manas Ghosh
Organising Secretary
&
Dean

From the Editors' Desk

Rural development has always been at the centre of state concern in independent India. The country has witnessed a checkered path of rural development efforts manifested through metamorphosis of intervention strategies and institutional arrangements. Integrated rural development, that envisions all encompassing prosperity of rural communities, seems to be a prospective proposition as far as improving the human well-being is concerned. This may also meet the diverse livelihood needs of rural people. This integrated approach asks for innovative development intervention and institutional forms. While, on the first hand, innovative delivery mechanism of public sector is a prerequisite, involvement of the 'third sector' will also emerge as a mainstreamed policy option for national and state governments. The mission mode programmes along with the long term rural development schemes may be amalgamated with the NGO and Private sector initiatives. Managerial insights, mostly employed in the sphere of corporate environment, needs to be incorporated in different aspects of rural development endeavours to encourage the innovations in rural development strategies and institutional forms. For actualisation of this vision, a dedicated pool of human resources will be needed in the rural development sector. Development of trained rural management professionals will hopefully meet this changing demand of rural development in India.

The present seminar has been conceptualized in terms of three related but exclusive dimensions that relates to the management of integrated rural development. The first one illustrates and takes account of experiences regarding different facets of 'integrated rural development' and their interrelationship. This envisages agriculture and allied sectors, education, health, women and child development etc. The second dimension focuses on the managerial aspects of rural development that includes rural development administration, tribal administration, social legislation, organizational management, development programme management etc. This was meant to draw cases from both public and private sectors. The third dimension covers the broader areas related to human resource management in the context of rural development profession. This will count both on academic as well as non-formal sector.

To suit these thoughts, the themes of the seminar *inter alia* have been thought as - (a) Spheres of Integrated Rural Development that includes - Agriculture and Allied Sectors, Education, Rural Health, Women and Child Development; (b) Institutional Issues in Rural Development which include - (c) Panchayati Raj Institution, Social Legislation, Tribal Administration, NGO/CBO and Corporate Social Responsibilities; (d) Rural Development Management including Management of Organisation and Management of Rural Projects/Programmes. Human Resources in Rural Development is taken up as a separate issue which will be covered by - HRD by Academic Institutions and Extension Education.

In all, 157 abstracts of received articles upto 20 November 2010 have been selected for inclusion in this volume. These abstracts have been broadly grouped into five major sub-themes - Sustainable Agriculture, Rural Health and Education, Women and Child Development, Institutional Issues in Rural Development, Rural Development Management. These contributions came from 5 countries spread over 87 educational and professional institutions. In that sense, this national seminar will be having the flavour of international character.

Mode of presentation of papers during the seminar, as contemplated earlier, will be 'platform' and 'poster'. All these papers are of equal importance and deserve equal status. We once again ensure that the posters will be adjudged by an Expert Panel and on that basis best three posters will be awarded by the Organising Committee.

Editors have taken up the task of categorization, compilation and editing of abstracts to maintain the academic integrity and scientific rigour of the document. This asked for small modifications in both content and form of the abstracts. We have tried to achieve this without sacrificing the science of the communications. However, the authors may be hold responsible for the information, statement and opinion expressed in their abstracts.

Dr. Debabrata Dasgupta
Dr. Prakash Kanti Das
Dr. Amal Kr Mallick
Mr. Amitava Dutta
Dr. Rupak Goswami
Dr. Md. Nasim Ali

SUSTAINABLE AGRICULTURE

SA-01: **Study of the effects of concurrent Rice-Fish culture on Rice (*Oryza Sativa* L.) yields and its role in rural development**

S. Garousi, A. Faramarzi, F. Saiedzadeh

Department of Agronomy, The Islamic Azad University, Astara Branch, Iran

Rice is one of the most important crops and major source of income for Asian farmers. Rice culture requires substantial amount of water, as fish rearing. This common necessity helps to rearing fish in rice field. In densely populated and poor rural areas where crop yield and income is low, Rice-Fish culture, concurrent product of rice grain and animal protein, will be of optimum use from the same land and through double crop production it will result in increased farm income. Besides, fish feeds on harmful insects, pests, weeds and algae which result in decreased weeding and pesticide use and finally decreased labor and production costs. Integrated Rice–Fish farming is an ecological agriculture where fish regenerate nitrogen and phosphorus to improve soil fertility and the consumption of chemicals is reduced to the minimum possible amount. Therefore, this farming has positive effects on the rice yield and is sustainable agriculture. Concurrent Rice-Fish culture could provide socio-economic and environmental benefits specially from the women participation viewpoint, who are an integral part of the farm labor force. In order to study the effects of concurrent Rice-Fish culture on rice yields an experiment was carried out with 5 rice cultivars and 4 species carp fish under randomized complete blocked design in 3 replicates in Astara in 2009. Studied traits were plant height, panicle length, panicle weight, seed number per panicle, unfilled grain per panicle, 1000-grain weight, tiller number per bush, paddy yield per bush, paddy biomass in each bush, paddy biomass in plot, straw weight, harvest index, and crop yield. The finding of this experiment showed that there was optimum status for all characters in concurrent culture than control (rice monoculture) and fish rearing in paddy field increased rice yield. Also, Binam cultivar with the highest yield was the suitable variety due to its compatibility with concurrent culture.

SA-02: **Sales and services provided by the farm input retailers of West Bengal towards its agricultural development**

Ashutosh Das [1], Debabrata Basu [2]

[1] State Agricultural Management and Extension Training Institute (SAMETI)/Agricultural Training Centre, Narendrapur, West Bengal, India

[2] Department of Agricultural Extension (EES), Visva-Bharai, West Bengal, India

A survey of 118 agri-input retailers selected from six blocks of South 24 Parganas district of West Bengal was conducted in 2008 to study type of agri-inputs the retailers sold and also to study various services provided by them in agricultural extension and development. It was observed that all the respondents sold pesticides like insecticides, fungicides, nematicides and bactericides, and fertilizers. Eighty five per cent of the amount of sale value emerged from chemical fertilizer, chemical pesticide and seed and the rest was contributed by other inputs. In respect of services, the input retailers were categorized into three groups; retailers with high investment (RHI), retailers with medium investment (RMI) and retailers with low investment (RLI)) based on mean and standard deviation of three groups of retailers. Rank correlation coefficient was observed significant among RHI and RMI and, RMI and RLI. However there was no significant association between RHI and RLI indicating the extent of extension services provided by retailers with high and low investment were independent. Some of the important services which were prioritized by all the categories of retailers were, 'taking care all types of farmers in technology dissemination irrespective of caste and class', displaying magazines, booklets, leaflets, posters etc. for farmers' awareness', 'selling various agricultural products in right price', 'promoting judicious use of agricultural inputs', 'supplying right inputs and information at right time', providing idea about plant protection measures', 'organizing farmers' training programme on behalf of agricultural department, company etc.

SA-03: **Participatory watershed management – a focused approach towards sustainable rural development**

Debtanu Maiti [1], Mahua Banerjee [2]

[1] Department of Agriculture, Govt. of West Bengal, India

[2] Department of Agronomy, Institute of Agriculture, Visva-Bharati, West Bengal, India

Climate change can adversely affect agriculture and water resources. The impact of temperature increase on water resources is perhaps the most important connection with sustainable development. It is projected that there will be increased water availability in the moist tropics and high latitudes, decreasing availability and increased drought risk in mid-latitudes and semi-arid low latitudes and increased water stress for millions. Existence of Himalayan glaciers is threatened. These glaciers are melting away, putting at risk freshwater supplies for millions of people in Asia. Meanwhile, India which is likely to get worst affected should take immediate steps in the water sector to preserve shrinking fresh water resources such that it is available with equal access to all. Watershed management is an evolving concept in India basically associated with proper storage and re-harvesting of rain run-off by appropriate management of natural and manmade watersheds. The approach to watershed management is participatory in nature, people friendly, location specific, process based and geared to cater to the problems and needs of the local/rural

communities. Watershed management is an alternative process of integrated decision making regarding uses and modifications of land and water within a watershed. People's participation is gradually being recognized by government agencies as an essential component of all developmental efforts including watershed management. The implementation of participatory watershed management has helped communities to overcome problems and gain control over their natural resources, livelihood and can ensure effective utilization of available resources. It provides a chance for stake holders to balance diverse goals and uses for environmental resources and to consider how their cumulative actions may affect long term sustainability of water resources. The steps for PWM are- identification of area for watershed management, developing plan, village level meeting and multi-village level meeting. The common components of PWM are- forestry, agriculture, horticulture, animal husbandry, energy conservation, community participation, training and awareness programme.

SA-04: **Sustainable agricultural and rural development through watershed management: a case study**

Satish B Aher [1], Janardhan R. Pawar [2]

[1] Badrinarayan Barwale College, Jalna, Maharashtra, India

[2] Sanjeevani Institute for Empowerment and Development, Aurangabad, Maharashtra, India

A predominant defining characteristic of the bulk of people living within rain dependant, ecologically fragile rural areas is poverty and marginalization due to low agricultural productivity, inadequate water for agricultural use and lack of fodder for livestock. The resultant pressure on the biomass utilization creates over-exploitation of natural resources and poor land husbandry. Any attempt aimed at rural agricultural development has to therefore address the problem of degraded natural resources, scarcity of water, low productivity of land, livestock and humans. In this present study, the Sundarwadi village, Tal, Paithan Dist., Aurangabad had undergone implementation of watershed development programme by Sunjeevani Institute for Empowerment and Development (SIED) funded by Watershed Organization Trust (WOTR). The development programme influenced the irrigation water availability, cropping pattern, crop production, land use, livestock, economic status of the people residing in the watershed and ultimately the rural development. All the impacts were found to be extremely positive and it is concluded that rural development is the product of sustainable agriculture and sustainability of agriculture in rain dependent area can be maintained properly only by adopting watershed approach.

SA-05: **Arsenic contamination through food-chain in Gangetic delta of West Bengal – looking beyond drinking water pollution menace**

Bishwajit Sinha [1], Kallol Bhattacharyya [2], Pradip Kumar Giri [2], S. Sarkar [1]

[1] World Bank NAIP Project "Arsenic in Food-Chain; Cause, Effect and Mitigation"

[2] ICAR Niche Area Project "Arsenic Management……..West Bengal"

Directorate of Research, Bidhan Chandra Krishi Viswavidyalaya, Kalyani, Nadia, West Bengal, India

The widespread arsenic contamination in groundwater in different parts of West Bengal has been detected to be distributed over 111 blocks, with dietary exposure of arsenic to nearly 35 million

people. Rice (Oryza sativa L.) is the major food crop of the endemic area which accounts for withdrawal of more than 50% of the total contaminated groundwater drifted for irrigation. An effort has been made, through the present study, to take an account of arsenic accumulation in rice over seasons along with possibilities of mitigating the toxicity hazard, in the arsenic affected villages of Chakdaha Block, Nadia district, West Bengal, India having an arsenic concentration of irrigation water drifted from the shallow tube wells in the range of 0.03-0.32 mg/l. The unique waterlogged rice rhizosphere was also contaminated by arsenic to the tune of 10.24- 19.17 mg/kg. Accumulation of the toxin in rice grain were observed to the tune of 0.42-0.67 (pre-kharif rice), 0.29-0.58(kharif rice) and 0.46-1.69 (summer rice). Consumption of rice straw containing considerable amount of arsenic (4.56-17.18 mg/kg) by cattle could potentially lead to increased arsenic levels in livestock and products which has been envisaged through findings of arsenic accumulation in hair, urine, feces, milk, egg albumin and egg yolk in the magnitude of 0.202.6.315, 0.001.0.391, 0.212-10.948, 0.012-0.428, 0.049-1.277, 0.001-0.631, 0.002-0.246 and 0.017-0.328 mg/kg respectively. A risk assessment of dietary arsenic intake of arsenic through rice revealed that maximum tolerable daily intake (MTDI) of arsenic for an adult of 60 kg body weight being 0.12 mg, a daily consumption of rice of 300 g day-1 would indulge a risk of daily arsenic intake of 0.507 mg which is > 400 % of MTDI. Use of relatively uncontaminated surface water (below detection level-0.03 mg/l) or soil amendment through organic manures like vermicompost, phosphocompost, FYM, municipal sludge etc. were observed to offload arsenic accumulation in rice grain to the tune of 4-24% and 8-54% respectively.

SA-06: **Factors influencing the level of pesticide abuse by the vegetable growers: an empirical study**

Sarthak Chowdhury, Prabuddha Ray

Department of Agricultural Extension, Agricultural Economics and Agricultural Statistics, Palli Siksha Bhavana (Institute of Agriculture), Sriniketan, Visva-Bharati, West Bengal, India

Pesticide abuse is the deviation made by the users from the ideal package of practices as recommended by the concerned authorities. This paper is a humble endeavor of the present researchers to identify the nature of the pesticide abuse and the factors that influenced the level of pesticide abuse in the selected vegetable (Cabbage, Cauliflower, Brinjal and Pointed Gourd) cultivation in the study area Katwa subdivision of Bardhaman district. The study revealed that the respondents abused the pesticides most in the selected vegetable cultivation from the various aspects and the independent factors viz. lack of knowledge of respondents about ETL concept, lack of loan sanctioning mechanism, lack of knowledge of respondents about the Integrated Pest Management (IPM) techniques, lack of training on the proper use of pesticides, malpractices by the sales agents and dealers of pesticide companies etc. were significantly and positively correlated with dependent variable- the level of the abuse of the pesticides by the respondents in the cultivation of the selected vegetables.

SA-07: **A study on the existing agricultural practices in three blocks of Ranchi district and the scope of augmenting income through promotion of integrated farming practices**

Sudarsan Biswas

Faculty Centre for Integrated Rural and Tribal Development and Management (IRTDM), Ramakrishna Mission Vivekananda University, Morabadi, Ranchi, Jharkhand, India

The study has been conducted in three villages (Hochar, Gudu, Garhgaon) of three different blocks (Kanke, Ratu, Bero) of Ranchi district of Jharkhand state. These villages are mainly economically dependent on agriculture and allied activities. Paddy is the main crop of this area during kharif season for medium and low land and potato for upland in the same season. The villagers of the surveyed areas cultivate different vegetables viz. pea, cauliflower, cabbage, tomato, French bean, potato etc during the *rabi* season. In spite of receiving about 1300 mm rain water the area becomes dry just after the rainy season. Although they use the hybrid variety for different crops and vegetables, but they do not use proper dose of fertilizer and pesticides and even they do not use modern improved technology and thereby they do not harvest the actual potential yield of various crops and vegetables. The main problems of this region are the poor irrigation facility, undulating topography, sandy nature of soil with poor water holding capacity etc. They rear various domestic animals besides farming. They feed the animals from agriculture and use the animals' excreta as manure in the field. There is ample scope of augmenting income through integrated farming practices in the study area. They are doing mixed farming. Hence, there is ample scope of Integrated farming for increasing the profit, sustainability, productivity and risk bearing ability. There is only need to provide technology, proper training, knowledge, idea/concept and motto of Integrated Farming System. An evaluative study has been conducted on Mukhyamantri Kisan Khushali Yojna, a programme for the promotion of integrated farming system in the rural areas of the state.

SA-08: **Scientific management of pests of paddy through participatory mode: a case study from Howrah district of West Bengal**

Amitava Banerjee, Sudipta Banerjee

Howrah Krishi Vigyan Kendra, Jagatballavpur, Howrah, West Bengal, India

Howrah, one of the predominantly paddy growing districts of West Bengal, produced 3.06 lakh tonnes of paddy from an area of 85.74 thousand ha during 2008-09. Proper management of insect and disease pests of paddy is a major challenge in all over the country and Howrah is not an exception. Excessive use of chemical pesticides, application of wrong pesticides, untimely application, application in improper doses are some common practices followed by most of the paddy growers resulting in number of problems like increasing cost of cultivation, reducing the population of beneficial fauna, developing resistance of the major pests over the pesticides, arousing residual problems and last but not the least – its harmful impact on environment. These

things happen mainly due to lack of knowledge as well as lack of consciousness about the proper identification and scientific management practices of paddy pests among the farmers. Keeping this in mind the present study was conducted at Chandul village of Jagatballavpur Block of Howrah district where farmers were involved in developing pest management schedule of paddy with the help of KVK scientists. The pest infestation scenario was identified by using PRA tools like seasonality diagram of pest infestation and its intensity. An awareness programme was conducted at the village where various aspects of pest management of paddy were discussed like concepts of Economic Threshold Level (ETL), Economic Injury Level (EIL), Integrated Pest Management (IPM), Integrated Disease Management (IDM), Bio-intensive Pest Management (BIPM) etc. Then a series of training was provided to the farmers on specific pest problems related to their field covering those aspects. A monitoring team was formed to observe farmers activity after being trained. As a result of that, it has been observed that majority of farmers' are using pesticides at present more scientifically which increased the productivity of the crop as well.

SA-09: **A study on vegetable based livelihood of small and marginal farmers of Jharkhand**

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Villages around Ranchi have been described as the '*vegetable* bowl' of Jharkhand. The present investigation was carried out at different villages of Angara (Ranchi district) and Karra (Khunti district) Blocks of Jharkhand with the help of questionnaires and interview among the purposively selected farmers. Most of the farmers under study areas of both blocks belong to either marginal or small category. The villages under the studied areas of the Karra block of Khunti district are subjugated for cultivation of different vegetables like potato, tomato, cauliflower, cabbage, chilli, brinjal, French bean, garden pea, cowpea, onion, radish, carrot, okra, ginger and garlic. Similarly, almost all farmers of the Badri and Obar villages of the Angara Block are interested to grow potato followed by tomato, brinjal and garden pea but only few of them are on behalf of growing carrot and onion. The benefit-cost ratio of potato and tomato were 2.30 and 4.00; 2.57 and 3.50; 2.73 and 4.46, for Tangratoli, Larta and Kusumtoli villages of Karra block, respectively. More than 3.0 benefit cost ratio was recorded in all cases of the three study villages of the Karra Block by growing cauliflower and cabbage. The benefit cost ratio for growing different vegetables in selected villages of Karra Block was more than 2.0 in almost all cases; these results justify the scope of vegetable cultivation as livelihood in the study areas of Karra Block. The finding also indicates maximum profitability for growing potato, tomato and cole crops like cabbage, cauliflower etc. under Karra Block of Khunti district. Similarly, the benefit-cost ratio of potato and tomato were 2.17 and 2.20; 2.08 and 2.14, for Badri and Obar villages of Angara Block, respectively. These findings are in favour of cultivation of such vegetables as livelihood options of the farmers of the both Karra and Angara Blocks.

SA-10: **Biodynamic farming can transform rural economy in the semiarid region**

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Biodynamic farming differs from organic farming in refusing any input from outside the system, inorganic or organic, except seed, but it is self sustainable. The system imitates the nature more closely but leaves scope for human intervention, particularly in respect of educating and employing human labour. The system is not input-driven but it is a holistic approach which understands the intricacies of life in various forms in its dynamics. Aboriginal people who have inherited an instinct of natural farming for thousands of years are the best people to adopt this concept early. A barren land with water harvesting structures takes about six years to bear the fruit of a biodynamic farm depending upon climatic conditions. The succession of life forms microbe, flora and fauna repeats the process of evolution on our mother earth. Plant architecture and biodiversity sustains and enhances nutrient and moisture status in soil and plant microclimate. Insects, reptiles, amphibians, birds and mammals build up a food pyramid equilibrium that takes care of pest problems. Mixed farming of numerous crops - food, fodder, fibre and medicine creates mutual exchange and sharing. The final question is if enough will be left for the man? Don't worry. If we control our greed for more and more, if we believe in peace and tranquility, there will be no dearth of food for anyone in the system, leaving enough surplus for high value export.

SA-11: **Intercropping of different multipurpose trees with pigeon pea – an agroforestry study**

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The role of agroforestry in food production system has been always implied. But it is only very recently the system has been explicitly recognised. Very little research is done ever on describing most of the practices. In agroforestry, tree and agricultural crops are combined together and they compete with each other for growth resources such as light, water and nutrients. The resource sharing by the components may result in complementary or competitive effects depending upon the nature of the species involved in the system. Keeping all the above mentioned proven facts, a field experiment was initiated in the year 2002 to study the compatibility of different MPTs with pigeon pea under agri-silviculture system and benefit of the system as a whole. Four MPTs, namely, Eucalyptus (*Eucalyptus tereticornis*), Akashmoni (*Acacia plectocarpa*), Sal (*Shorea robusta*) and Simul (*Ceiba pentandra*) have been growing since 2002 at Research farm of BCKV, Jhargram under red and laterite zone of West Bengal. Tree species were planted during August 2002 at a spacing

of 5m × 5m. The experiment was laid out in randomised block design with 6 replications for each tree species separately. Broad spacing of tree species gives an opportunity to grow intercrops for the first few years. Intercropping with rainfed legume crop is of immense importance for bringing in quick returns during first few years. Pigeon pea (*Cajanus cajan*), one of the most important pulse crops in India, was grown as an intercrop in MPTs plantation during *kharif* season of 2008 and 2009 to increase productive capability of land and profitability as well. Experimental results revealed that all the growth parameters (tree height, bole height and dbh) and volume yield of all MPTs were higher when grown under agroforestry system than sole plantation. Except plant height and number of seeds/pod, all biometrical parameters, yield attributes and yield of pigeon pea were slightly higher in sole cropping than agroforestry system. All the growth and yield attributing characters as well as yield of pigeon pea were higher under *Ceiba pentandra* plantation as compared to other MPTs plantation. This may be due to better interception of sunlight through the canopy under *Ceiba pentandra* plantation. Moreover, pigeon pea being a legume crop was also significantly better than control situation in improving soil physico-chemical properties resulting into better growth of MPTs under intercropping situation. Therefore, it may be inferred that *Ceiba pentandra* + pigeon pea based agroforestry system has immense potentiality for increasing productivity of land in western red and lateritic tracts of Bengal. Practicing agri-silviculture system on a large scale can impact agricultural crop production as well as industrial wood production.

SA-12: **Participatory organic farming by Grower Group Certification – a holistic approach for sustainable development of small and marginal group of farmers in West Bengal**

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The state of west Bengal is charecterised by having 90% of small and marginal group of farmers, have been accustomed to cultivate crops with modern technologies but presently experiencing several problems like land degradation, water pollution, erosion of biodiversity and environmental services and highly market driven and for them agriculture is not profitable enterprise. Hence, farmers are in search of alternative agriculture like organic farming which offers opportunities for work, safeguards quality drinking water, protects and sustainably uses agrobiodiversity and traditional knowledge, maintains ecosystem carrying capacity for food production for present and future generation and supports private and public sector initiatives to enable efficient food production by all farmers. They may form a grower group and abide by the norms developed by an Internal Control System (ICS) which is essential for getting certification as "Organically Produced Products" by an authorized certification body as per NPOP (National Programme for Organic Production) norms. With the adoption of Participatory Guarantee System (PGS), the farmers may be benefited through enjoying higher premium price for their produce and also achieve healthier soil for sustainable production for future generation. In West Bengal, Society for Voluntary Equitable Actions (SEVA) at Atghara, district North 24 Parganas, developed a

Grower Group Association and successfully produced certified organic jute and vegetables in an areas of 100 hectare and organized marketing channels for selling the produce of farmers. At all the marketing points consumers showed their satisfaction of having better shelf life and good taste of organic vegetables, fruits, dairy products etc and their good feelings help to motivate the other consumers. The dried organic jute is procured by the Ganges Jute Mill, a producer of export oriented jute based packing material used for packing the exported organic products. Therefore, farmers' participatory organic farming may be an alternative way for sustainable livelihood security for farm family and also keep pollution free to their surrounding environment as well as ecosystem.

SA-13: **Effects of technology on crop production and rural development**

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The present research is concerned with the study of the impact of technology used in agriculture of Tinsukia District which is situated in the upper part of the Brahmaputra valley. To examine the changes in paddy area, the concerned statistics for 1990-91,1999-2000 and 2006-07 were considered and collected from Estimates of Area, Production and Average Yield of Principal Crops in Assam, Directorate of Economics and Statistics, Guwahati and related statistics of Land use for the calculation of NSA of Tinsukia District (1992-93 to 2004-05), statistics for the growth rate of population of the district as well as for the state (1991 and 2001), and the statistics used for the generation of attributes of modern technology were collected from the published volume on Land Utilization Statistics, Directorate of Economics and statistics and Statistical Handbook of Assam, Guwahati respectively. Processed data were also shown by maps and diagrams for the clear depiction of the facts. It is found that although the population of the district is increasing but there is a noticeable reduction in the area of the paddy crop as a dominant crop in the cropping pattern which is the result of many socio-economic and bio-physical factors. Interestingly the deficiency in cropping pattern is meeting up by the increasing use of technology which is clear from the fact that the cropping intensity has been increased from 137 percent to 141.5 percent during the period considered for the change. It means the main cause for such changes in production is intensification of technological inputs through strong market forces and extended road network.

SA-14: **Adoption of advanced production technology and evaluation of grain quality of Gobindabhog rice in Nadia district of West Bengal**

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The adoption of on-farm tested advanced technology for Gobindabhog, an aromatic rice landrace is a great challenge to the agricultural extension system of West Bengal, India. A work programme

was undertaken for Gobindabhog rice cultivation in about 134 bigha land of 78 farmers in 6 blocks (*viz.* Chakdah, Ranaghat I, Ranaghat II, Hanskhali, Santipur and Haringhata) of Nadia district during *kharif* season of 2009 under technical supervision of RKVY Project team of Bidhan Chandra Krishi Viswavidyalaya, Nadia. Analysis of adoption data shows that 47.1 % farmers transplanted Gobindabhog rice during 3rd week of July with a spacing of 15 cm (45.7 %). Although 74.3 % farmers adopted integrated nutrient management system comprising organic manure as basal and chemical fertilizers in splits, but most (92.9 %) did not apply any pesticidal measures in their fields. Grain quality analysis of 11 samples collected from 5 blocks reveals that mean moisture content, head rice recovery and protein content were 13.6%, 58.5% and 6.76 %, respectively.

SA-15: **Integrated and sustainable dairying: a tool for poverty eradication and rural prosperity**

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Sustainable and integrated dairy development programme focuses on poor landless herdsmen and farmers, indigenous low producing cattle, different breeds of cow and buffalo, biodiversity in dairy animals; medicinal, therapeutic and nutritional value of milk from Indian cow and buffalo and traditional system of value addition for production of indigenous milk products. The traditional model of dairy farming is sustainable even today with all pressure of small land holdings and lack of pasture land. It also helps us to illustrate the emphasis of animal husbandry programmes to alleviate poverty that are being followed by many developing countries. A sustainable and financially viable dairy farming which will generate income and self employment and entrepreneurship is the need of the day. Milk production is the key livestock activities to generate income on a steady daily basis for poor households. Income from dairy production contributes on an average 40 percent of household in East, 32 percent in North, 21percent in South and 34 percent in West zone of the country. At the same time the growing competitiveness in production and marketing of dairy products observed during last few decades necessitate the recognition of entrepreneurship development as major area of sustainable dairy development and prosperity of dairy farmers at large. In spite of abundant physical resources, a country cannot make rapid economic and social advancement unless it has enterprising people with necessary knowledge, skill and support system. We were largely able to capitalize on our cattle resources through cooperative model successfully. This is well known success story of Indian dairy farmers, given the perfect and timely support through various integrated dairy development projects by government agencies in mission mode.

SA-16: **Economics of different fruit based cropping system with coconut under alluvial plains of West Bengal**

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Effective utilization of available space, both horizontally and vertically, is the modern concept of cropping system. Growing coconut as monocrop is the most inefficient way of using natural resources. Multispecies cropping system ensure maximum resource capture and use, leading to higher yield per unit area of soil, water and light. A field experiment was carried out in 26years old coconut (cv. East Coast Tall) plantation of AICRP on Palms at Horticultural Research Station, Mondouri, Bidhan Chandra Krishi Viswavidyalaya, Nadia during 2003 to 2008 with six coconut based cropping models i.e. Model I: Coconut + guava, Model II: Coconut + lime, Model III: Coconut + lemon, Model IV: Coconut + Pineapple, Model V: Coconut + Banana and Model VI: Coconut. Model-V (consists of coconut + pineapple) was more remunerative showing highest net return of Rs. 45600/- followed by Model-IV (Rs.36050/-). Maximum B:C ratio was recorded in Model-IV (1.20) followed by Model-V (1.16). It was also observed that multiple cropping in coconut plantation under recommended package of practice of both main crop and inter crop, had no adverse effect on production of coconut. Fruit based cropping system with coconut, comprising of coconut and pineapple was found best under West Bengal condition.

SA-17: **Technologies for rice production towards sustaining self-sufficiency and strengthening rural economy in West Bengal**

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The economy and livelihood of the Indian population is mostly dependent on agriculture that is directly linked to many facets of rural development, including poverty eradication, health, education, etc. West Bengal is one of the eastern states with population of 8.02 crores as per Census (2001), covering 2.7% of the geographical area and about 7.81% population in India. There has been a gradual and noticeable progress of agriculture and rural economy, especially with land reforms and associated structural changes in the state which ranks first in rice production (14.72 million tonnes), having an area coverage of 5.72 million hectares with an average productivity of 2,573 kg ha^{-1}, and produces more than the present requirement in 2007-08. The state is now self-sufficient in production of rice, potato and vegetables. As rice is a staple food for most of the people, there is an urgent need to sustain the self-sufficiency in rice production *vis-a-vis* to strengthen the rural economy. Though the growth rate of rice production in the state still continues to be greater than the rate of population growth, it is a matter of serious concern that the production growth slows down primarily due to plateuing of productivity. Moreover, the price of rice has been increasing at a much slower rate than the unit cost of production, showing the strains of diminishing net returns for the farmers who are thereby loosing

interest in sustaining the growth in rice production. Low cost production technology is, therefore, the demand of the day. Hence, emphasis should be given on use of improved seeds as well as adoption of modern technologies to produce more rice from less inputs, particularly under the situation of burgeoning population, changing world climate, shrinking land and water resources, etc. The present paper is intended to illustrate the production constraints and different technologies for sustainable rice production.

SA-18: **Complete commercial utilization of sugarcane: a boost to rural economy**

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Sugarcane, a perennial grass of the genus *Saccharum* is an important industrial crop with India being second highest producer after Brazil. Sugarcane grown all over India is basically used for sugar or jaggery production. The dried and left-over lignocellulosic bagasse is burnt as fuel for the boilers and is used in paper and pulp industry. Biotechnological techniques can be employed for better economic utilization of the agro-industrial residue, sugarcane bagasse. It can be used for production of biofuel (bioethanol), biosorbent, bioplastics and biocomposites, substitute for packing materials in biofilter and in bioremediation. Whole or treated bagasse and bagasse hydrolysate have been reported for production of enzymes, single-cell protein (SCP), xylitol, ethanol, protein rich cattle feed etc. through submerged fermentation. Bagasse can also be used as carbon/energy source for enzyme, pigment, aromatic substances and animal feed production in solid-state fermentation (SSF). It is used as an inert carrier in manufacturing of various pharmaceuticals and chemicals like citric acid, glutamic acid, ergot alkaloids and penicillin. On account of its high yield (about 80 tonnes/hectare) it is considered as a rich solar energy reservoir. High photosynthetic capability of sugarcane (fixing about 2-3% of solar radiant energy and transforms it to green biomass) allows it to show a high coefficient of CO_2 fixation, comparable to the moderate climate zone woods. This contributes to the decrease of the greenhouse effect imparting environmental benefits. Integrated rural development through proper training, counseling and advice to agricultural workers *vis-à-vis* technical up-gradation by developing high yield seeds, better utilization of water, land and fertilizers with sustainable agricultural methods can boost the rural economy.

SA-19: **Sustainable agricultural land use and associated activities: a case study of Shankarpur mouza in Ranaghat-II Block of Nadia district, West Bengal**

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Land is the basic resource for the emergence and sustainable development of all living things including human beings. It is significant not only in the sustainability of land use but also socio-

economic activities. The main objective of this paper is to analyse the sustainable agricultural land use and the existing socio-economic activities of the Shankarpur Mouza in Rnanaghat-II Block in Nadia District, West Bengal. The mouza comprises of 610 households and covers an area of 611.70 hactares. According to Census 2001, the mouza has a population of 6150. The paper deals with various agricultural land use and socio-economic factors, like population characteristics, educational status, occupational patterns, income, household amenities, mass media contract etc. Agriculture is the main economic activity of the study area. The agriculture and the allied activities are largely controlled by the inhabitants. Required data and information have been collected through extensive empirical survey. The collected data have been tabulated and analyzed with the help of simple statistical and cartographic techniques. Recommendations are also made for the improvement of sustainable agricultural landuse and the associated activities of the people in the study area.

SA-20: **Effect of Paclobutrazol on Nutrient Uptake in Mango Seedling**

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Mango has a natural tendency to yield profuse vegetative growth which is considered to be responsible for its poor yield and irregular bearing habit. Paclobutrazol is a much used growth retardant in mango orchard for enhancing yield and regular bearing. Literature abounds with information regarding effect of paclobutrazol on shoot growth retardation but little work so far has been reported on its effect over nutrient uptake by the roots. The present experiment was conducted to study the effect of paclobutrazol on nutrient uptake by the roots; leaf photosynthetic pigments contents and accumulation of storage carbohydrates in different parts of the mango seedlings. Mango seedlings of about six months age were hydroponically grown in half Hogland solution and subjected to five concentrations of paclobutrazol, viz. 0, 1 ppb, 100 ppb, 500 ppb, 1000 ppb for seven days and the residual nutrient ions contents in the culture solutions was determined. Paclobutrazol caused increased uptake of nitrate and phosphate but decreased uptake of potassium and calcium where as it had no effect on uptake of magnesium, copper, iron, manganese and zinc.

SA-21: **Integrated management of aqua-terrestrial ecosystem for enhancing productivity and promoting rural sustainability in agro-climatic zones of Indian sub-continent**

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Diverse unused or waste wetlands including coastal biosphere tracts and uncounted scattered deltas of Indian subtropics possess high productive ecosystem comprising diverse assemblage of

flora and fauna. These are immensely valuable, useful for fish-aquatic crop diversity, preserved carboniferous environment of the ecosystem as sources, sinks and transformers of a multitude of chemical, biological and genetic materials, which served as *'natures kidney'* (James, 1995) and ultimately sustained economic stability to millions of people in the regions. The stability of the ecosystem of these regions is often subjected to varying degrees of stresses and degradation caused by different man-made activities and natural factors. Integrated wetland management programmes suited to bio-diversity of the zone-specific, are thus imperative to make upliftment of rural economy as well, as the mounting pressure of this area poses a threat to the ecosystem and makes it vulnerable for their normal life support. Wetland ecosystem including coastal biosphere comprises of 25-30% that intersected with the main river system (*The Ganges, Brahmaputa, Padma, Mahanadi, Mahananda, Rupnarayan* etc.) and it's so many tributaries like oxbow lakes (*mauns, chaurs, jheels, beels, baors, nayanjali* etc.) predominant in Indian subtropics, mostly in Indo-Bangladesh regions. These are immense valuable, resourceful for fish variables (major and minor carps, live-fishes snakehead, air-breathing catfishes, edible shellfish, perch, murrels etc.), nutrient-rich aquatic food crops (*Trapa bispinosa* Roxb., *Euryale ferox* Salisb., *Nymphaea* spp., *Colocasia* spp. etc.), non-food commercial crops including its value-added products and integrated fish-crop diversity, as these have out-yielding ability and remunerative as well, mostly preferred by the common urban and rural people and ultimately, sustained for economic stability to millions of people of the regions. This paper deals greatly with number of case studies were undertaken during last 15-16 years in utilizing divergence *'Tal'* wetland ecosystem (deep, semi-deep, temporary in NAZ, OAZ and Coastal Zone of the regions) on a wide sector of downtrodden resource-poor to marginal fish-farming communities with the involvement of NGO's through implementation of TOT, TDET (PRA/awareness camp, training, technological updating demonstration cum trials) based research projects (State aided, NWDPRA, ICAR-Agriculture as well as Fisheries sector, DoLR, Govt. of India etc.) on the development of integrated management programmes suited to zone-specific (i) System approach (excavation and renovation, methodological approach), (ii) Management (fish-crop management, inter and post-harvest care and processing, marketing), (iii) INM utilizing organic as well inorganic sources, including (iii) Low-cost fish-feed, effectively utilized on fish-crop diversification to a great extent. This paper also deals with some endangered indigenous live-fish species, which are really threaten to be endangered during recent past decades due to more than one proximate factor. The unique approach of watershed plans (*bherri* system), which were formulated integrately for upright production system, exhibited economic outturn due to wide use of natural resources as well. Comparative advantages significantly exhibited with mixed farming system (GP, GMR, NP, NPV and B-C ratio over subtracting the cost of production) than monoculture system, which was economically viable, even to the resource poor fish-farm families, exhibited >2.5 folds, gained to its sustainable level of the regions as a whole. From the study it may be concluded that it is thus imperative to utilize this vast wetland ecosystem, particularly north-eastern part of the country with impetuously for food, livelihood, engagement of household labours and ultimately, economic stability, who are inextricably linked with rural economy and sustainability as well.

SA-22: **Sustainable agriculture with biogas energy**

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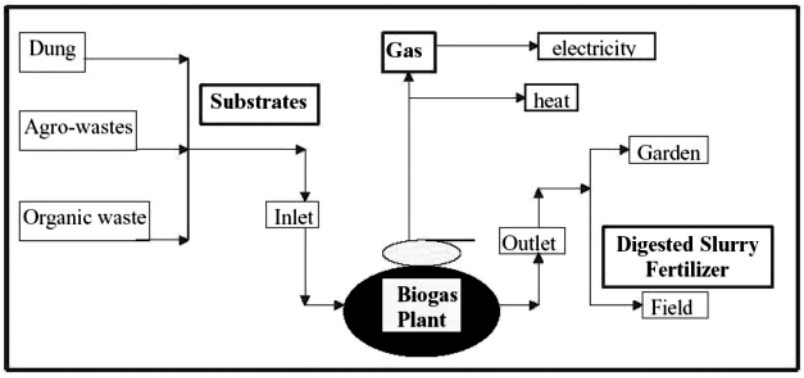
India has tremendous potential for energy generation through biomass and its residue. The source of fuel as raw material power plant is agriculture waste and residue which otherwise goes as waste. The project has very low gestation period of 12 to 18 month and can be implemented on various scale of 8 MW to 20 MW. Total cost for the project is $1.5 Million/MW which is comparable with the conventional energy source. Since the power generation and receiving ends are in vicinity, there will be very less transmission loss. It will provide rural employment and also decrease the dependence on the foreign fuel. Being a Carbon neutral project it will also reduce the environmental degradation. Biogas represents an alternative source of energy derived mainly from organic wastes. In India, the use of biogas derived from animal waste, primarily cow dung has been promoted for over three decades now. The estimated potential of household biogas plants based on animal waste in India is 12 million. Till December 2004, under the National Biogas Programme, over 3.7 million biogas plants in the capacity of 1-6 m^3 had been installed. Low cost biogas plant of 2 cubic meters is Rs. 9000. Biogas plant of 85 m^3 capacity can produce 250 tones of organic manure per year, which produce 4.0 tones nitrogen per year. The minimum additional yield of food grains may be expected to be about 20 tones and the total estimated potential is 17000 +MW. Total number of biogas plant, which can be built in India, is 12 million, which have potential to provide employment for 30 million people. The hypothetical project given in the present article was formulated on the basis of authentic data, which need to be tested empirically.



SA-23: **Solar PV pumping system: an emerging issue in rural agricultural development**

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Irrigation pumps in the agriculture sector account for about 10 to 15% of electricity consumption in India and something like that in West Bengal**.** However inefficiency in agricultural water

pumping systems leads to wastage of energy. As a panacea to such a pandemonium trusting on solar pumping system will be a viable alternative option. Pumping water with solar power is advantageous in many respects. So they are attractive from engineering as well as user point of view. Thus an effort was made to explore the dimensions of solar pumping system with an explicit consideration of its components and types, advantages and drawbacks, application domains and performance analysis. West Bengal has three regions- where rural electrification is poor - Bankura-Purulia Region, Darjeeling Region and Sundarban Region. Except Darjeeling Region solar radiation availability is sufficient to run different electrical gadgets with solar electricity. In such a position, SPV pumping system may be installed at Bankura-Purulia and Sundarban Region both for drinking and irrigation purposes. Such pumping systems have already been installed at Patharpratima, Gosaba Blocks in Sundarban and Fuljhor village of Ranibandh block, Bankura. The agriculture in India is highly dependent on rainfall due to low penetration of irrigation facility. On the other hand a significant portion of rural population is deprived of safe drinking water. In both the cases the main reason is either grid is absent or the grid is not equipped properly for providing quality power supply with appropriate voltage and minimum interruption. In this background, SPV pumping system can fill up the gap in respect of grid penetration or quality power supply.

SA-24: **Recycling of agricultural wastes to sugarcane production in Old Himalayan Piedmont Plain soils**

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A field study was conducted during 2004-05 at Regional Sugarcane Research Station farm, Thakurgaon to develop an economically suitable package of organic and inorganic fertilizers for sustainable sugarcane production in Old Himalayan Piedmont Plain soils of Bangladesh. Results revealed that the treatment T_8 that received 2/3rd of recommended inorganic fertilizer ($N_{120}P_{35}K_{100}S_{25}Zn_2$ kg ha^{-1}) along with press mud @10 t ha^{-1} and wheat straw @5 t ha^{-1} significantly produced higher sugarcane yield (101.32 t ha^{-1}) among all except T_7 and T_4, which were statistically similar. Again, the treatment T_7 having 2/3rd of recommended inorganic fertilizers and press mud @10 t ha^{-1} produced the second highest sugarcane yield (100.38 t ha^{-1}). However, T_7 showed the highest gross margin of BD Tk. 1, 05, 022 ha^{-1} with MBCR 5.52 in the study area.

SA-25: **Maximum utilization of every *pros* and *cons* of an individual homestead**

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In Bangladesh, homestead space resource is very much significant in respect of income, food security and environmental revive though it does not seem that much viable to all relevant development practitioners, as land crisis was not that much acute earlier. In the recent past even before the independence, people were habituated to use this homestead spaces just in this and

that way. After independence in 1971, having severe fragmentation of land, it is now so smaller in size that people feel no more use of such mini land. But in context of reality, it should come under practice as a hidden potential utilizing every pros and cons of an individual homestead thus at least the women can create their partial job opportunity and get income and nutrition for them and their children as well keeping at home. In this regard, bio-technology against each homestead space utilizing component is an essential to explore its best maximum return.

SA-26: **An assessment of biological, social and techno-managerial factors influencing ichthyofaunal diversity and productivity of different lentic aqua system of Uttar Dinajpur district of West Bengal**

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Fish is one of the important sources of animal protein that contribute to nutrition and food security of million of rural poor apart from being an important livelihood option. Both its productivity and diversity are of critical importance to sustain rural livelihoods. However, research in fishery has largely concentrated on bio-physical and physico-chemical factors in comparison to socio-economic factors while studying the productivity and diversity of aquaeco systems. The present study carried out in two randomly selected Blocks of Uttar Dinajpur district with the objectives of recording ichthyofaunal components inhabiting different water bodies on the basis of their availability and abundance and also to identify and assess the influence of different bio-social and techno-managerial factors on Ichthyofaunal Diversity and Productivity. In consultation of multiple stakeholders of fishery development 26 factors were identified. Data collected through a mix of qualitative and quantitative techniques like participatory appraisal techniques and questionnaire survey on water bodies and from their owners revealed gradual decline in the species diversities of ichthyofaunal species and out of 53 recorded species one was extinct, three endangered, three vulnerable, nine rare and 37 was of least concern according to the IUCN classification. Out of 26 identified factors, respondents' training, family size, pond ownership status, cost incurred, pond location, area and depth of pond, water regime, pH of water, stocking density, plankton density, lime and cow dung use significantly influenced ichthyofaunal productivity. Whereas, respondents' training, pond ownership status, pond location, depth of pond, water regime, pH of water, stocking density, and lime and cow dung use significantly influenced ichthyofaunal diversity of the aqua system measured in Shannon-Weiner Index. The results showed the significant influence of both bio-social and techno-managerial factors on ichthyofaunal diversity and productivity. This may be taken up by planners and academic researchers for pragmatic interventions in lentic aqua system.

SA-27: **Technology adoption and technical efficiency in fish culture – a non parametric analysis**

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In recent years, Government of West Bengal has been extending several facilities like financial,

technological and extension support in order to increase fish production in tanks and ponds by composite fish culture practices. Despite all these facts, low productivity of fish clearly leads us to conclude that technologies developed in government laboratories and training services provided by extension personnel were either not producing the desired result or not being adopted by the farmers. Answers to the question of why farmers don't adopt (or, partially adopt) the technologies must serve as the basis for increasing adoption through modification of the current package. Present study, based on primary survey on 360 fish farmers in West Bengal, has revealed that adoption level was low since 76 per cent of the respondents fell under the low adoption category. In order to investigate the effect of adoption intensity upon technical efficiency of fish farms, data envelopment analysis has been followed. Using meta-frontier methodology, grand and group (according to intensity of adoption) technical efficiency has been calculated. It is found that technical efficiency increased directly with the increase in adoption intensity. Adoption efficiency was highest (0.834) for intensive farmers, whereas the respective figure was as low as 0.362 for traditional farmers. Socio-economic characteristics (like age, experiences or education) as well as pond size or extension contacts affect the level of adoption intensity of fishers. In order to investigate the effects of such variables, multiple regression analytical tool using the ordinary least squares (OLS) method was applied. Overall, the study revealed that the level of education, farm size, farm income, and extension contact were positively correlated with adoption of the fish production technologies, while age was negatively correlated. There is the need to jettison the present training approach. Rather visit system for farmer-group and farmer field school approach may suit the present day dispensation. As extension has been found significant effect on adoption, more fisheries extension agents should be employed by FFDAs. Efforts should also be made to facilitate interest-free loans (as financial assistance has been found positive correlation with adoption) so that they will be able to expand and by eventually be able to adopt costly innovation. Extension agents should increase the frequency of their visit to fish farmers.

SA-28: **Woman Farmers in the context of "Towards Sustainable Agriculture in Rajasthan"**

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1. Objective of the issue- Ownership and entrepreneurship of landed property as socially most valued social and economic asset by women. "In the Indian traditions, (law apart) women are denied rights over land except in matriarchal systems. In their childhood, female are dependent on their father and after marriage on their husbands and in old age on their sons. Because of this excessive dependence on male family members throughout their life, girls and women have tendency to lose interest in becoming independent economically and otherwise." **2. Decision making by women- Control over factors of production i.e. land, labor, capital and management.** Labor can be hired, if capital is available. For capital rural credit market is also against women. Money lenders' intention mostly is for lending and grabbing the land. With the application of prudential norms, bankers try to safe-guard their interest and often avoid women borrowers except that of women SHGs. Management of a farm or agricultural field involves decision making. Women kept themselves away from decisions so far as it requires mingling with

other males- seeking asymmetric information regarding crops varieties sources, practices, interaction with Government Extension Agencies, Credit Institutions, Adhatiya (Chota or Bara) etc. **3. Legal issues-** The People's Union for Civil Liberties (Rajasthan) submitted petition in the Supreme Court. It says that, realizing the right to food requires not only equitable and sustainable food system, but also entitlements relating to livelihood security such as the right to work, land reforms and Social security for women as well. **4. Social issues -** Because of the feudal systems and social traditions, the ownership are transferred to the male members of the family and this tradition has deprived women of their right to property. **5. Pro-active role of NGO's and Civil Societies -** To remove social disparities, within and outside family, greater social awakening is required. Out of the priority sector advances, it should be made mandatory to make advances to women SHGs, Joint Liability Groups of Women, women undertaking allied activities etc. The NGO's and civil societies must play a pivotal role in bringing about social changes for empowerment of women, providing food security, health, education etc.

SA-29: **Zabo farming system for sustainable agricultural production in Nagaland**

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Sustainable agriculture includes three main issues-environmental health, economic profitability, and social and economic equity. Sustainability rests on the principle that we must meet the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable Agriculture is a special kind of agriculture using farming techniques which make maximum utilization of the environment without causing any form of harm to it. The outputs from Sustainable Agriculture are devoid of any types of inorganic chemicals such as pesticides and insecticides. This farming technique uses the organic way of farming. All these factors produce the products in a more environment friendly manner and are thus healthier for the consumers to consume. Nagaland state lies between 25° 6' and 27° 4' latitude north of equator and between 93º 20' E and 95º 15' E longitude having an area of 16,579 square kilometers with varied topography. Zabo farming system is an indigenous farming system practiced in Phek district of Nagaland having a combination of forest and agriculture incorporating the livestock and fisheries with well-founded conservation base, soil erosion control mechanism, water resource development and management. *Zabo* means impounding of water and has got much relevance for sustainable agricultural production and development in Nagaland. It envisages proper utilization of rainwater and maintenance of soil health due to organised source of crop nutrition. The system also encourages the farmers for rearing livestock and fish as a subsidiary source of income. With the sustainable development point of view, Zabo farming system is considered as one of the best farming systems following traditional approach, which helps in natural resource conservation and is non-pollutant. In addition, it is also reasonably high yielding and socially acceptable as farmers themselves have evolved with their indigenous skills. Keeping these points in view a research study was undertaken in Kikruma village of Phek District of Nagaland selecting 60 respondents randomly. Semi-structured and pre-tested interview schedule was used for collecting the relevant data by conducting personal interview. Findings revealed that in four

different categories of Zabo terrace fields, production of rice ranged from 30 to 48 quintal per hectare of local varieties, which is equally good as scientifically recommended yield. Use of leaves and branches of plants such as *Alnus nepalensis* and *Mekhomu* etc for green manuring was most common. Application of cow-dung and diversion of run-off through open cattle-yard were the usual methods of manuring paddy fields. Inorganic sources of nutrients were not used and farmers also used naturally growing Azola for increasing soil fertility. Seepage losses through bunds were observed to be checked with the use of paddy husk on the upstream side. Most of the farmers practiced paddy-cum-fish culture generating additional income. It is evident from the present study that Zabo farming system in addition to following a sustainable approach of agricultural production by using indigenous and eco-friendly farming practices by tapping available natural resources judiciously, is helpful for providing avenues of increased income and employment for socio-economic development of farmers.

SA-30: **The shackles of the stagnant ethnic agriculture in North-East India**

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In North East India most of the ethnic groups are accustomed to a relatively complacent living, in keeping with their own attitudes, practices, and traditions. Each ethnic group has its own unique situation conditioned by its own social institutions and attitudes. Since conducive social institutional and attitudinal environment is a critical pre-condition for agricultural development, this paper attempts to identify the social institutional factors inhibiting transformation of traditional agriculture of the Poumai Naga ethnic group. A hypothesis was put forward and examined that the villagers did not make concerted effort to rationalize agricultural practices, and that because of their tendency to social conformity and lack of interest in bringing about changes in productive techniques in agriculture, the social and economic barriers to agricultural development were never directly challenged.

SA-31: **Study on some aspects of fisheries resources and socio-economic condition in the haor Nikli, Kishoregonj, Bangladesh**

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A study was conducted on some aspects of fisheries resources including overall socio-economic condition of fishermen of the haor Nikli at Nikli upazila under the district of Kishoregonj for a period of 16 weeks. The status of hydrographic parameters, types of fishing gears used, catch assessment survey (CAS), species composition were also studied within that period. Various types of fishing gears were found to operate in this haor, these were broadly classified into 3 groups, such as, nets, traps and wounding gears. A total of 5 types of nets, 1 type of trap and 1 type of wounding gear were recorded. A total of 41 species of fish were identified from the catches of different gears used by the fishermen. Among the different types of nets, the highest number of species was recorded from the catches of seine net (31), which was followed by big cast net (27)

and relatively less number of species were recorded from the catches of push net (13). Socio-economic condition of haor fishermen were presented in age group, religion, family size and composition, educational status and income. It was found that age group of 25 to 50 years was the highest (53.44%) and less than 25 years was the lowest (20.04%), considering all gears. It was recorded that Hindus were featuring as the absolute majority (60%) and Muslim was remarkably lower (40%). The largest family size (13 persons) belongs to the push net fishermen and the lowest family size (1 person) among the long line fishermen. Regarding the educational level 63.33% of haor fishermen were illiterate, 28.33% were up to primary level and 8.33% had only secondary level. In general, majority of the fishermen were illiterate. The highest average monthly income was found among the seine net fishermen and the lowest average monthly income was found in the push net and long line fishermen. It may be concluded that seine net fishermen were more efficient than those using other gears in the concerned area.

SA-32: **Community development and sustainable community forestry: a study of interventional model and strategy of Bhuthya-Akashpura and Veerpur tribal villages of Shahada Taluka, Nandurbar district, Maharashtra**

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An empirical study was conducted to understand the model and strategy of Bhuthya-Akashpura and Veerpur tribal villages for a sustainable Community Forestry of Shahada taluka, Nandurbar district in Maharashtra with a participatory approach with the objectives - to understand the community participation for community forestry, initiated by the people; to understand the model used by the tribal village for social action; to study the strategies used for sustainable community forestry model; to study the strategies used for dealing with authorities. A descriptive method with a participatory research approach was used for the study. Activists, people participated in the social action was interviewed with a semi-structured interview schedule. Focus group discussion, corner meetings and interview method was used for primary data collection. Accidental sampling method was used to primary data collection and special case studies were also introduced in the study to make the study more meaningful and qualitative in nature. The major findings of the study were - people initiated the social action against the forest department to stop the deforestation in the tribal village, the indigenous people are more concerned about the forest, and tribal people worship the forest, indigenous people manage and protect the forest, forests can be saved by local community sustainable model, tribal people have saved 1800 hector of forest with active people's participation, it is the culture of the tribal people to save forests, community participation is an effective model for sustainability, participation of local people can be an effective strategy for implementing the policies and programs for the people, uniting and forming a pressure group of local people can be a good strategy for dealing with authority. The conclusions drawn from the study suggested that indigenous people have capacity to sustain the community forestry and can sustain the biodiversity of the forest. Community forestry can, thus, be an alternative to tribal development. Privatization of forest can be treating for tribal villages.

People's local model can be an effective model for sustainable community development and their planning and action plan can be the best strategy for community development. Democratic decentralization should be in place for formulation of the requisite programs and policy.

SA-33: **Integrated management of terrestrial ecosystem for enhancing vegetable productivity and farmers livelihoods in different agro-zones of West Bengal**

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The significance of vegetables in our daily life is very important. Vegetables are the rich source of starch, minerals, vitamins, protein and also contained some medicinal properties. So its values are inevitable in nutritious food ingredients. In India, most of the people belong to below poverty line (BPL) and whose are unable to purchase the costly nutritious foods like fish, meat, egg, milk etc. in their daily diets, where as vegetables can supply those nutrition easily and cheaply available to people, particularly to the rural community. From survey, it has visualized that vegetable was cultivated in 67.55 lakh ha of lands (2.8% of total cultivated land) and production was 1014.33 lakh tones, which was not sufficient to meet the demand of increasing population and this production was able to supplement only 175 gm/capita/day, instead of 300 gm/capita/day (according to ICMR). So, it is obvious to step forward for higher vegetable production as well as productivity with improvised productive system in the projected areas. This paper deals with number of case studies undertaken on different categories of seasonal vegetables effectively utilized at the terrestrial land system adjacent to wetlands, which was developed through the project sources in NAZ, OAZ and Coastal Zone of the regions on a wide sector of downtrodden resource-poor to marginal farming communities through implementation of TDET-based transfer of technology (ToT) on the development of integrated management programmes, viz. (i) land system approach, (ii) management approaches and (iii) application of INM utilizing balance form of organic as well inorganic sources, including, respectively. For leafy vegetables, croprs were received @ 1.5 t FYM or 0.5 t neem oilcake ha^{-1} and for others - 2.5 t FYM or 0.75 t neem oilcake ha^{-1}, respectively. In addition with this, for leafy vegetable crops also received inorganic fertilizers like N: P_2O_5: K_2O @ 20 : 30 : 20 and for other vegetables @ 40 : 30 : 30 kg ha^{-1}, respectively. The unique production system, which was implemented for upright production system, exhibited economic outturn due to wide use of natural resources as well. Economic advantages significantly exhibited with the centre of this farming system (GP, GMR, NP, NPV and B-C ratio over subtracting the cost of production), which was economically viable, even to the resource poor farm families, even exhibited >2.0 folds, gained to its sustainable level of the regions as a whole. From the study it may be concluded that this terrestrial land system adjacent to wetlands be utilized of the regions with impetuously for food, livelihood, engagement of household labours and ultimately, economic stability as well.

SA-34: **Sustainable agriculture in developing countries – constraints, challenges and policy options**

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Sustainable agriculture (defined as "a method of agriculture that attempts to ensure the profitability of farms while preserving the environment") demands new efforts in research, development, and implementation. Dedicated stewardship is the first step toward sustainable agriculture. There must be a commitment at the highest levels of government, and this must be coupled with an action program that addresses the needs of farmers in the context of the environment. In developing countries, farmers' immediate concerns include improving crop yield, increasing crop diversity, and increasing income. This presentation aims to look into key constraints and challenges in sustainable agriculture in the context of developing countries. It also discusses biotechnology as policy option for sustainable agricultural development. The paper concludes that "use of environmentally sustainable practices in agriculture can contribute to both poverty alleviation and food security". By integrating sustainable resource management practices into agricultural programs, farmers and rural communities can increase their agricultural productivity and competitiveness while also protecting the environment. Past experiences show that "developing countries can build efficient and competitive economies without destroying the productive agricultural base on which they depend".

SA-35: **Organic sources of nutrients for sustainable potato (*Solanum tuberosum L.*) production under West Bengal condition**

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The organic sources of nutrients play a great role in crop and soil productivity in the long run without deteriorating the environment as well as in enhancing the food quality. In addition to the growing need for demand of organic food globally, equal emphasis has also been given for sustainable crop production to overcome the devastating effect of chemically evaded agriculture. Potato being an important food crop in West Bengal, a field experiment was conducted during rabi season 2008-09 at Gangetic alluvium of Block Seed Farm, Adisaptagram, Hooghly, West Bengal with the main objective to study the effects of organic sources of nutrients for sustainable potato production. The experiment was carried out in Randomized Block design with 8 treatments viz, T_1**:** Control, T_2**:** Crop Residue@ 8t/ha, T_3 : Crop Residue @ 5t/ha + Bio-fertilizers, T_4: FY M @ 30 t/ha, T_5 : Crop Residue @ 5t/ha + FYM @ 20 t/ha, T_6 : Vermi-compost @ 10 t/ha, T_7 : Vermi-compost @ 5 t/ha, T_8 :Vermi-compost @ 8 t/ha + Bio-fertilizers and replicated thrice. The results revealed that potato crop receiving vermicompost @ 8 t/ha +

biofertilizers produced highest fresh weight of tubers, total dry matter, crop growth rate, tuber bulking rate and yield. The different biochemical parameters differ significantly with different treatments. In case of ascorbic acid and starch content, the highest value is recorded in treatment receiving vermicompost @ 8 t/ha + biofertilizers. With respect to sugar content, the highest content is recorded in treatment receiving Crop residue @ 5 t/ha + Biofertilizers which is followed by treatment receiving Vermicompost @ 8 t/ha + Biofertilizer. The results as a whole indicated that application of biofertilizers along with crop residues or vermicompost gave higher growth and tuber yield and there is increase in ascorbic acid, sugar as well as starch content with the inclusion of biofertilizers alone with other organic sources. Economic analysis of the experiment indicated that the highest net return was obtained in treatment receiving Crop Residue @ 5t/ha + Bio-fertilizers. Thus, it can be concluded that organic sources of nutrients play an important role in sustainable potato production with improved quality.

SA-36: **Farm level production of biocontrol agents- a viable alternative for sustainable agriculture**

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Banana, a second major plantation crop in the world is being cultivated in 400 hectares of land in Kannivadi, Dindigul District, Tamil Nadu. Among the various diseases reported in banana, (*Fusarium oxysporum*) and rhizome rot (Erwinia spp.) alone is estimated to cause an annual loss of 10 $ US billion. To overcome this, farmers adopt indiscriminate usage of chemical fungicides frequently. This has led to alarming effects such as deterioration of soil health, water, air and accumulation of toxins in the food chain. Moreover, an increase in the cost of cultivation is being experienced regularly. At this juncture, Integrated Disease Management (IDM) plays a major role and many farmers feel it is need of the hour. *Trichoderma viride* is a potential biofungicide which controls rhizome rot and wilt diseases. In order to enable the availability of quality products in time a decentralized production faculty was facilitated. M. S. Swaminathan Research Foundation (MSSRF) has demystified the technology involved in mass production of *Trichoderma*. It was promoted as an ecoenterprise and imparted training to women self help groups belonging to rural poor. Biofungicide production unit is successfully run by a group of 12 women members. The root dipping (rhizome treatment) and timely soil application 5 Kg per hectare has reduced the disease incidence and has led to increase in the yield by 40%. This paper highlights the challenges met and the benefits derived such as horizontal transfer of knowledge and technology, capacity building, leadership quality employment generation to women members, reduced chemical usage, higher cost benefit ratio and sustainable yield to farmers in the process.

SA-37: **Screening for salinity tolerance in rice and its management**

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A major portion of land in India, are coastal areas which is about 2.3% of the total area under rice cultivation. So we aim to screen some salt tolerant germplasms and appropriate management

strategies to uplift the productivity of saline areas. Screening was conducted in laboratory and field conditions. Seventy eight paddy varieties were tested under laboratory conditions at a salinity concentration of 5dms^{-1} and their root and shoot length was compared with their respective control. Germplasms showing some tolerance were tested in field at Baruipur and Sagardeep. On comparing different characters at harvesting stage, varieties like Bakulpriya, Lakshmikajal, Nangalmuda, Bhuri, Khaersal, SR-26B showed salinity tolerance in both laboratory and field screening. These varieties were tested for quality parameters namely grain type, volume expansion ratio, hulling % and ASV. Khaersal, Bakulpriya, Bhuri, Nangalmuda showed better quality parameters than others indicates wide scope of these varieties in saline prone areas. To quest different management strategy to salinity three experiments were conducted. In 1st experiment 12 paddy varieties were tested for 7dms^{-1} and 10dms^{-1} salinity concentration using Hoagland solution. Most of them showed appreciable performance over control. So, if proper nutrient is applied it's possible to avoid deleterious effect of salinity to some extent. In 2nd experiment five paddy genotypes were tested for salinity tolerance using 19 treatments in 5dms^{-1} saline solution. Most of the treated seeds performed better over control. Turmeric, Dhania and Lemon leaf powders were effective for all five genotypes. So seed treatments, can be a potential method to combat salinity stress. Finally geminated seeds of 41 paddy varieties were directly sown with normal spacing in the field of Sagardeep (a high saline prone area) and their performance in respect of productivity were better than their average productivity in transplanted condition indicating scope of direct sowing in saline prone areas.

SA-38: **Screening for salinity tolerance and management for improved productivity in Chickpea and Lentil**

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Salinity is a common problem worldwide now, which causes poor development of pulse crops. Tolerant genotypes as well as improved management practices that are well suited to saline conditions are needed to enhance and sustain pulse production in saline zones. Studies were conducted to screen a large number of Chickpea and Lentil genotypes for salinity tolerance in laboratory condition. Seeds of thirty one cultivars of Chickpea and forty five cultivars of Lentil were grown in 0 dsm^{-1} and 5 dsm^{-1} of NaCl solution. After seven days root lengths and shoot lengths were evaluated. Cultivars showed different response to salinity. G 24, Vijay, Murshidabad local cultivars of chickpea and IC 201693, IC 201664, IC 208356 cultivars of Lentil performed better in saline condition. Studies were also conducted by treating the seeds with different herbal treatments to induce salinity tolerance. NP 209 variety of Chickpea and Midnapore local variety of Lentil were taken for this experiment. Treated seeds were grown in 0 dsm^{-1} and 5dsm^{-1} NaCl solution. Considering the overall performance of Chickpea (NP 209) and Lentil (Midnapore local) in 5dsm^{-1} NaCl solution, it was observed that the treatment hing powder produced beneficial result. Salinity tolerance of the treated Chickpea (NP 209) and Lentil (Midnapore local) were further tested in 5dsm^{-1} Hoagland solution with their respective control. It was observed that in 5dsm^{-1} Hoagland solution both the pulse crop performed well than before. It was found that if proper nutrient can be applied it is possible to avoid deleterious effect of salinity to some extent.

SA-39: **Sustainable agriculture and allied sectors**

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Agriculture is a very important sector of the Indian economy. Today, India ranks second worldwide in farm output. Commonly known three crops are Rabi, Kharif and Zaid but the peasants now also grow and cultivate for intermediary crops in between them in shape of cereals and plants, flowers and vegetables and also grass for cattle's. Fifty two percent of the total population is still working in agricultural sector. It is still the largest economic sector and plays a significant role in the overall socio-economic development of India. India is the largest producer in the world of milk, cashew nuts, coconuts, tea, ginger, turmeric and black pepper. It also has the world's largest cattle population. It is the second largest producer of wheat, rice, sugar, groundnut and inland fish. It is the third largest producer of tobacco. Agriculture contributes a sizeable part to exports. Agriculture provides the principal means of livelihood for over 58.4% of India's population. It contributes approximately one-fifth of total gross domestic product (GDP). Agriculture accounts for about 10 per cent of the total export earnings and provides raw material to a large number of industries. Low and volatile growth rates and the recent escalation of agrarian crisis in several parts of the Indian countryside, however, are a threat not only to national food security, but also to the economic well-being of the nation as a whole. Strategies and programmes have been directed towards replacement of traditional and inefficient implements by improved ones, enabling the farmers to own tractors, power tillers, harvesters and other machines, availability of custom hire services, support services of human resource development, testing, evaluation and research and development. A huge industrial base for manufacturing of the agricultural machines has also been developed. Introduction of technologically advanced equipments through extension and demonstration besides institutional credit has also been taken up. Equipments for resource conservation have also been adopted by the farmers. Under various government sponsored schemes like Macro Management of Agriculture, Technology Mission for Oilseeds, Pulses and Maize, Technology Mission on Horticulture, Technology Mission on Cotton and National Food Security Mission, financial assistance is provided to the farmers for the purchase of identified agricultural implements and machines.

SA-40: **Integrated Pest Management of Coffee Berry Borer: An effective tool for sustainable Agriculture**

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Thonihills is located at 11°40' – 11°42' N latitude and 77° 40' – 77° 42' E longitude and elevated from the plains by 1000 – 1350 m MSL in the western slopes of the Kodaikanal hills of Dindigul district, Tamil Nadu. Coffee is the predominant crop cultivated in 500 acres with lemon, pepper, orange and Banana as inter crops. Though there are several insect pests recorded in this region, the serious pest is Coffee Berry Borer (CBB), *Hypothenemus hampei*. Due to the infestation of CBB, premature shedding and damaged berries make them unfit for national market. It also

results in reducing bean weight, irregular berry size and unpleasant flavor, which affects the income of the resource-poor small and marginal farmers. M.S.Swaminathan Research Foundation (MSSRF) took this as a challenge and trained the farmers to tackle the insect pest by adopting Integrated Pest Management (IPM). Since, coffee is grown under organic mode, an integrated approach using physical, mechanical and biological methods were adopted. Setting up of simple bait traps followed by timely release of parasitoid, *Cephalonomia stephanoderis* and application of white muscardine fungus, *Beauveria bassiana* led to decline in the damaged berries, premature shedding. It also led to increase in the yield by 25%. This study highlights the methods adopted in the management of CBB and its efficiency and how the process was facilitated at the community level among farmers.

SA-41: **Agriculture led strategies for rural economy: the new growth engine**

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Agricultural sector is the mainstay of the rural Indian economy. Indian agriculture is now facing challenges like hunger, poverty, shrinking and degrading production resources, low investment, poor competitiveness and lack in agricultural research, education and technology development as well as inadequate regulatory and legislative provisions which are forcing unequal pace of growth in farm and non-farm sectors. The thrust now being on higher sustainable growth in food grain production and other agricultural commodities, increase in productivity with efficient use of resources in agriculture is of paramount importance. The paper discusses the strategies of economic reforms which can give a major boom in rural economy and overall economic development of the country. Further the need for sustained and broad based agricultural development which is critical for raising living standards, alleviating poverty, assuring food security, generating buoyant market for expansion of industry is also discussed. Further the paper stresses the need and effectiveness of the local or rural institutions in translating agricultural production into profit which is *sin-qua-non* for equitable societal development and in turn transforming the 'Rural Economy' in true sense to 'a New Growth Engine'.

SA-42: **Scope of sustainable agriculture and allied sector with a special reference to Sikkim and Darjeeling Hills**

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In present day context, we have known that industrialization has added much to the economy of the nation but agriculture is the backbone of India's economy. It provides direct employment to

about 64% of working in the country. It contributes about 26% of gross domestic product and constitutes about 18% of the total value of India's export. The outlay on agriculture has been rising steeply during the successive plans. Agriculture has changed dramatically, especially since the end of World War II. Food and fiber productivity gained momentum due to new technologies, mechanization, increased chemical use specialization and government policies that favoured maximizing production. Although these changes have had many positive effects and reduced many risks in farming there have also been significant costs. Prominent among these are top soil depletion, groundwater contamination, the decline of family farms, continued neglect of the living and working conditions for farm labourers, and the disintegration of economic and social conditions in rural communities. A glowing movement has emerged during the past two decades to question the role of the agriculture establishment in promoting practices that contribute to these social problems. Today this movement for sustainable agriculture is garnering increasing support and acceptance within mainstream agriculture. Not only does sustainable agriculture address many environmental and social concerns, but it offers innovative and economically viable opportunities for growers, labourers, consumers, policy makers and many others in the entire food system. Sustainable agriculture integrates three main goals – environmental health, economic profitability and social and economic equity. Sustainability rests on the principle that we must meet the needs of the present without compromising the ability of future generations to meet their own needs. This stewardship of both natural and human resources is of prime importance. Coming to the hill areas like Sikkim and Darjeeling, setting various industries, agriculture and its allied sectors play more vital role. Tea industry in Darjeeling hills is taking a back seat nowadays. So improving the agriculture along with its allied sectors is the sole alternative to the people in these areas to balance their food supply as well as the economy of the place. The main hinderance on the way to make agriculture sustainable in hill areas is the regular soil depletion which ultimately exploits the soil fertility as well causes rapid soil erosion. Another odd is the availability of sufficient water for irrigation of the field. The only sources of water are the natural springs and the monsoon rains and these are getting reduced due to various environmental disturbances. These hill areas are in a state of privilege because all such barriers to realize sustainable agriculture can be overcome only through a sensible planning in practicing agriculture. The depletion of soil through soil erosion can be well controlled by planting fruit bearing trees in the lower fringes of sloppy land or tea can be planted to check the soil erosion. The cultivated land in a contour type of farm land should be kept in the middle portion. Above the faming land tree plantation and medicinal plants can be grown which help to keep alive the natural springs. Cultivation of medicinal plants is very much suitable in hill areas as the history proves that hill areas have various life saving herbs. Another important profile of agriculture in hill areas is the organic farming. Nowadays people are getting conscious to use vermicompost and the natural manure of dungs of domestic animals. This practice will not only improve the soil structure but also enhances the environmental set up of the place. The practice of crop rotation or the practice of mixed farming helps to maintain the mineral level of the soil without using inorganic fertilizers. In the hill areas farming of lentils fringes with maize and other millets is a good example of mixed farming. Farming of millets can be done even in the areas getting very scanty water supply. The food value of lentils and millets is unparallel. The agro-based industries like jam, juice, pickle making and packaging, medicinal plants, horticulture and floriculture (especially orchid and gladiolus), dairy farming and milk chilling unit, piggery, apiculture, pisciculture and

sericulture, tea and coffee, leather supply etc. can be encouraged in such a level which not only help to make agriculture sustainable but also help to add up to gross National Income. The state of Sikkim is putting up its endeavour in this field but it demands more technological guidance. The state of Sikkim has a vision to make the state fully organic by the year 2009. Under its visionary plan it has incorporated the following perspective of the organic state as - a healthy eco-system, tonic free nutritional food, marketing avenues, globally compatible, profit oriented ventures for farmers. The thrust crops are Large Cardamom, Ginger, Orange, Passion fruit, Eskus (Cayote), Turmaric, Tea, Medicinal plants, Cymbidium orchid, Pear, Peach and Plum and Off season Vegetables. To achieve these, the State has planned for following strategies - discouraging the usage of chemical fertilizers and pesticides, conversion of 100 villages (in the first place) fully organic through effective micro-organism echnology (EM Tech), popularizing rural and vermicomposting and local based enriched composts, installation of bio-fertilizer production unit, sensitization of capacity building and training for farmers, farm labourers and field functionaries, transport and communication needs a little bit of attention to make the marketing successful. The State of education and health in the rural areas are better in the hill areas compared to other parts of the country. But more emphasis should be given to vocational education. In the areas of health the government hospitals and health centers should be equipped with more advanced equipments and more facilities should be provided. So with proper Technological guidance and sufficient financial support, the sustainable agriculture and its allied sectors can be made to bloom to its pageantry of success in the hill areas of Sikkim and Darjeeling.

SA-43: **Comprehensive study on soil health that imperative for aquatic cropping system in ToT-based research project in different agro-ecological zones of West Bengal**

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The wetland is really a valuable ingredient in our environment whose economic importance is immense, can not be ignored. Existence of wetlands is about 8,558 lakh ha in the world, of which approximately only 1% is in India. Categorically wetland is the intermediate situation in between terrestrial and aquatic ecosystem. In hydrological cycle, wetland have important responsibility of balancing this cycle in a systematic manner. In wetland, generally Histosol type of soil has been found, which contain 10-12% organic carbon and is very suitable to produce aquatic crops and also congenial for fish culture, especially inland freshwater carps. This paper deals with number of case studies were undertaken in the different categories of wetland ecosystem, which developed through the project sources (Technology Development, Training and Extension, a ToT-based project of Department of Land Resources, Ministry of Rural Development, Government of India) in New alluvial zone, Old alluvial zone as well as Coastal zone of the state of West Bengal. From

the project sources, initial soil samples were collected from the different 5 projected centres [(i) Haringhata - II under Haringhata; (ii) Kalinarayanpur, Birnagar, Radhanagar under Ranaghat - II in Nadia; (iii) Ahiron, Sujnipara and Ajogarpara under Ahiron in Murshidabad; (iv) Taldi, Purba-Bayersingh and Chandkhali under Taldi, Canning in South 24-Parganas and (v) Nabagram, Masagram and Jaugram in Burdwan district, West Bengal) from the representative randomly 5 ponds prior to need-based excavation and renovation works and establishment of crop culture for determining the physico-chemical properties of the pond-bottom soil. However, soil of the fields (ponds) were mucky in nature (heavy to heavy clayey), dominated mostly by more clay percentage than the others (silt and sand, but silt is more than that of sand), which represented good and very congenial/ideal condition for the good growth and development of aquatic food crops as well as fish variables (particularly for live-fishes). In almost all the projected areas, soils were almost neutral in reaction and medium in N, organic C, available P and K, respectively. The total average N content (0.074 and 0.072%) was highest in the soil of Kalinarayanpur, Nadia and Purba Bayersingh, Canning (South 24-Parganas), while, the highest average values of P_2O_5 (93.6 and 90.8 kg ha^{-1}) in the soils of Kalinarayanpur (Nadia) and Mosagram (Burdwan) and K_2O (248.3 and 245.2 kg ha^{-1}) was highest in Masagram under Burdwan and Birnagar under Nadia district, respectively. Over all, it is to be noted that total N, available P_2O_5 content were also recorded as medium concerning all the sites of the project. However, from the data, it is to be noted that all the test values were below the permissible limit, which suggested that the quality of pond soil in respect of those test values were found good, hence, it may be utilizable for aquatic crops as well as pisci-culture safely.

SA-44: **Water management interventions for human resources and rural development**

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Water for irrigation is major indicator of agricultural growth that summarizes its strong positive correlation with poverty alleviation. The availability of cultivable land is exhausted, wherein irrigation helps in increasing crop and water productivity through increasing cropping intensities providing more profitable cropping patterns accessible to the small holders. The integrated management of water resources could only be possible through adoption of efficient and optimum use of irrigation water, which could only be ensured by judicious and economic use of irrigation potential whatsoever created to increase crop production. The integrated water resources management also includes the concept of rainwater management that has got an immense important on the way to develop the rainfed farming system. In the areas of medium to heavy rainfall, there is ample scope of tapping excess rain water through suitable water harvesting structures constructed for this purpose for its subsequent uses as irrigation or to apply life saving irrigation to the crops which should also come under the purview of water management for crop production. It has got relevancy particularly in installing small-scale irrigation system based on farmers' participatory approach for sustainable crop production for maintaining sustainable growth and development of agriculture. The results of the studies on these aspects revealed that there were positive impacts of irrigation water on crop productivity, cropping intensity, input use,

farmers' income and employment generation and poverty alleviation. The availability of irrigation facilities has enabled the farmers to raise nearly one extra crop a year with consequent implications for household food security with higher yields of the crops grown along with labour employment per unit of land. The opportunities of rural development has thus been assigned with possibilities of water management interventions through adoption of National Rural Employment Guarantee Scheme of The Government of India creating and assuring at least 100 man days for single farmer a year keeping pace with rural development might be come forward as an ingredient towards social change in contemporary West Bengal.

SA-45: **Cyclone 'Aila' and its effect on physico-chemical properties of soil and water in coastal-saline zone of West Bengal, India**

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A devastating cyclone 'Aila' was struck in the coastal area of West Bengal including East Midnapore, Howrah, Burdwan, South 24 Parganas and Kolkata on 25th May, 2009. However, the most affected area was Sundarban, the world largest delta, traversing South and North 24 Parganas. More than a fourth of the 3500 km of mud embankment collapsed due to impact of 20-25 foot tall tidal waves, resulting sea water and mud impounding approximately 6600 ha of crop fields. This rendered the affected area unsuitable for cultivation. The collected soil and water samples from Kultali, Pathar Pratima, Kakdwip block of South 24 Parganas registered the higher salinity/alkalinity with soil pH, Electrical conductivity (EC) (dSm^{-1}), Na ion concentration ($meql^{-1}$), ESP ranging from 7.33 to 9.85, 5.0 to 15.0, 25.0 to 32.0 and 12.7 to 16.4, respectively. Again, the water quality suffered with pH, EC (dSm^{-1}), Na ion concentration ($meql^{-1}$) ranging from 7.95 to 8.55, 30 to 45, 213 to 403, respectively. The crop and soil scientists should address the emerged task in the post-Aila scenario of the coastal saline belt to address the important issues involving reclamation of cultivable land, cultivation of resistant/tolerant varieties, construction of water harvesting structure to harvest sweet water for cultivation, application of huge amount of decomposable organic matter etc.

SA-46: **Evaluation of the understanding of organic production and certification processes for customization in rural set ups through elements of participatory learning**

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The benefits of organic agriculture have not been realized fully, even though the organic market is expanding due to rapid economic growth and increasing environmental and health concerns in the world and India as well. Organic agriculture has largely been promoted as no or low-

chemical and sustainable farming approach with different countries at different stages of establishing their own organic certification systems. So, India needs to promote the national programme for organic production (NPOP) to suit diverse national circumstances and to enhance capacity building. In many parts of India, since primitive age, agriculture has been intrinsically organic in nature by default. The imported concept of green revolution has not only amounted to its volume of biological productivity but also undermined its agro-ecological soundness and social fecundity for creating income and livelihood. Now, India is undergoing the effect of pseudo-modern agriculture, which is neither sensitive to its resource-base nor persuasive to its posterity. So organic farming is basically a revisit to the old tradition of oriental agriculture, splendidly interwoven with sustainable use of natural resources and human praxis to synergize the production process. The present paper examines the people's participation at the micro-level to know the status and determinants of organic farming vis-à-vis social and operational inhibitors, value parameters of organic production and issues of certification as conceived by the operators. The survey was conducted in vegetable growing belts of Nadia district (AEZ for vegetables) of West Bengal during 2007-08. The primary data were generated mainly through PRA and PLA methods and also through group discussion and trainings. It has been found that the main problem relating to organic production and certification are acceptance skepticism, lack of concept and community learning, lack of befitting technology and poor institutional networking. Hence there is huge scope for peoples' participation and for social capital building.

SA-47: **Growth, yield and quality of soybean (*Glycine max* L.) as influenced by different levels of phosphorus and sulphur**

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Field experiments were conducted during the *kharif season*, 2006-07 and 2007-08 at the Central Research Farm, of Bidhan Chandra Krishi Viswavidyalaya, Gayeshpur, Nadia, West Bengal to study the growth, yield and quality of soybean (*Glycine max* L.) as influenced by different levels of phosphorus and sulphur. The experiment was conducted in split plot design with four levels of phosphorus (0, 30, 60, 90 kg P_2O_5/ha) as main plot and four levels of sulphur (0, 20, 40, 60 kg/ha) as sub plot treatments replicated thrice. The results showed that among phosphorus levels 90 kg P_2O_5/ha and among sulphur levels 60 kg S/ha were significantly superior recording higher growth parameters, grain yield, protein and oil content.

SA-48: **Myo-Inositol with seeds Phosphorus and total chlorophyll content in groundnut genotypes**

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A field experiment was conducted at the Main Agricultural Research Station, University of Agricultural Sciences, Dharwad during Kharif 2008 to study the effect of myo-inositol on seed

phosphorus and total chlorophyll content in groundnut genotypes. The experiment consisted of two treatments, foliar application of inositol @ 100 ppm at 65 DAS (during pod and seed development) in 10 genotypes of groundnut (TAG 24, JL 24, R-2001-3, K-07, GPBD 4, GPBD 5, K-134, TKG-19A, Girnar 1, and GPBD 6) and another set of genotypes maintained without inositol application as control. The experiment was laid out in factorial design with 20 treatment combinations in three replications. The foliar application of inositol (100ppm) increased seed phosphorous and total chlorophyll content significantly. The genotypes also differed significantly for both seed phosphorous and total chlorophyll content. The genotype GPBD4 had significantly higher seed phosphorus (0.95%) and total chlorophyll content (1.69 mg g fr. wt.-1).Whereas the lowest seed phosphorous content in K-134 (0.41%) and the lower total chlorophyll content in K-134 (1.58 mg g fr. wt.-1) were observed.

SA-49: **Nutritional security and economic upliftment of rural women through homestead kitchen garden, zero-energy cool chamber and small scale processing unit**

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Food insecurity and malnutrition result in serious health problem and reduce human potential in developing countries. Secondly, huge quantities of fruit and vegetables are lost due to improper storage and lack of knowledge about preservation among the rural people. To overcome this problem of malnutrition in rural women and wastage of fruits and vegetables in the rural sector this present program was undertaken during the last three years at Narayanpur village of Chakdah Block, district Nadia of West Bengal. Results revealed that establishment of homestead kitchen garden where different vegetables were grown organically proved effective in overcoming malnutrition of rural women and their children. More vegetables (80%) were consumed by participant women than before the project programs and excess were sold in the local market for income generation. Substantial storage of fruits and vegetables (4 – 5 days depending upon fruit and vegetable) were possible through construction of zero energy cool chamber at the household which were low cost and eco-friendly and generated some income by storing fruit and vegetables. Similarly nutritional security was also achieved through processing unit maintained by rural women. Different value added products viz. guava jelly, tomato sauce, lemon squash, dried potato, cauliflower and cabbage were utilized for family nutrition and additional income generation. Finally, it is concluded that homestead food production has had an impact on reducing micronutrient malnutrition. Substantial storage of fruit and vegetables and preservation were good for nutrition and income generation of rural women.

SA-50: **Somatic embryogenesis of *Allium sativum* (Garlic) *via* callus formation**

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Sustainable agricultural development is made possible through careful research and assessment programs to preserve the environment and promote the biological diversity of agriculture and

forest. The development of improved and standardized protocols would make somatic embryogenesis more economically viable. *In vitro* propagation is an alternative approach to the conventional method of vegetative propagation that ensures rapid and large scale plant regeneration, free from diseases. On the other hand, plant regeneration from callus culture is very important to obtain the variable genotypes in addition to diploid ones Educating both industry and the public about somatic embryogenesis and genetic engineering would promote social responsibility through informed decision making when producing or buying agricultural products. In the future, somatic embryogenesis could play a key role in both improved agriculture and forest conservation methods and increased productivity. The species of *Allium*, particularly *Allium cepa* and *Allium sativum* belonging to family Liliaceae, are used as vegetable crops throughout the world and also have immense medicinal value as a possible cancer preventive. As these crops are propagated through vegetative means, tissue culture techniques are particularly important for raising the elite clones and maintenance of other valuable genetic strains. *In vitro* protocols have been reported earlier for *Allium* sp. but there are little reports on somatic embryogenesis *Allium sativum* commonly known as garlic has been used throughout recorded history for both culinary and medicinal purpose It has a characteristic pungent, spicy flavour and has been used for cooking as well as medicinally. Studies revealed that of species of *Allium sativum* (White Rosette,White Single)are respond for callus culture in somatic embryogenesis by using Murashige and Skoog's medium (Murashige and skoog,1962) to which exogenous growth regulators (2,4-D and Kinetin)are supplemented in various concentration and selection of the best media for callusing,best media for regeneration of shoots and roots. In case of WHITE ROSETTE MS+2, 4-D(4mg/lit)+KN(0.2mg/lit) is proved as best media for callusing and ½ MS+KN(1mg/lit) is proved as best medium for regeneration of shoots and roots. In case of WHITE SINGLE MS+2,4D(2mg/lit)+KN(0.2mg/lit) is proved as best media for callusing and ½ MS is proved as best medium for regeneration of shoots and roots.

SA-51: **Climate change impact on agriculture and farmers' adaptation strategies in selected villages of Sunderbans**

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Climate change is a matter of concern for the whole world. Among various fields which are being affected by climate change, Agriculture is most important as it accounts for 24% of world output, employs 22% of world population and uses 40% of land area. In developing countries like India this figures are even higher. With special reference to Sundarbans, most of the farmers of the area are dependent on agriculture and many of them are vulnerable against depleted natural resources. Many of them are also staying below the poverty line. The effect of climate change will make them more vulnerable. Hence, both the impact and adaptation with climate change impact are important areas of concern. The present study was undertaken in three randomly selected villages of Patharpratima Block of Sunderbans region to study the local perception of climate change, its impact on agriculture and the adaptation strategies taken up by the farmers to cope up. Information collected through PRA and personal interview through semi-structured interview

guide revealed that farmers considered climate change in terms of temperature rise, erratic rainfall, slower wind speed, absence of certain seasons and inflated level of river water. These spelled differential impact on agricultural practices like water scarcity, lower production, increased biotic pressure, reduced soil fertility, inability of raising certain crops or enterprise altogether etc. Farmers adapted these changes by adopting new crops, newer varieties, changed sowing time, changed spacing etc. The findings of the study will help the planners to adopt agricultural intervention in the area that best adapts and least affects global worming without disturbing the livelihood security of the farmers.

SA-52: **Efficacy of *Pseudomonas fluroscens* against Bacterial Leaf Blight in paddy**

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The present study was conducted with a view to assess the potentiality of bacterial antagonists to control leaf blight of rice caused by *Xanthomonas Oryzae pv Oryzae*. In the present study six strains (isolated from different crop of *P. fluroscens)* were collected and their biochemical assay as well as antagonistic reaction was done in laboratory against *Xanthomonas Oryzae pv Oryzae*. Out of these six strains, the S_1 (isolated from Rhizoplanes of Chilli) based on laboratory performance was the best in case of biochemical assay as well as antagonistics reaction evaluated for disease suppression on rice crop in field in Randomized Block Design with four replications. After application of *Pseudomonas fluorescen*s in field, the proliferation of bacterial blight caused by *Xanthomonas oryzae* pv oryzae was reduced. The reduction of disease was highest when *Pseudomonas fluorescen*s was used as spray and soil treatment. This might be caused due to release of growth regulatory substances or indirectly by releasing antibiotics, producing HCN, iron chelating siderophore and causing P-solubilization.

SA-53: **A comparative study of the efficiency of low cost bio-inoculums with commercial product in composting and root development**

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From the present study it could be concluded that the low cost or no cost bioinoculums like *Sanjibani* and *panchgavya* could be considered as good as commercially available bioinoculum to be used for decomposing the biodegradable agricultural waste. On the other hand it may also be stated that *Sanjibani* and *Panchagvya* is also effective in reducing the decomposition period (as compared to control) of the waste material so that compost or vermicopmpost may be produced in less time without investing any price. Sanjibani was found to be better than the control and

commercial product wth respect to wet weight and dry weight of root mass in all types of cuttings. Overall response of semi hard wood cuttings was not satisfactory against bioinoculum as well in commercial product. The interesting findings may encourage commercial nursery based entrepreneur to use low cost bio-inoculum for intiating roots in case of cutting as a means of propagation in different plants. No remarkable variation was found among the treatments with respect to organic C, P and K content.

SA-54: **A study on shelf life and Biochemical analysis of *Panchagavya* and *Sanjibani* – two important organic liquid manures**

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Panchagavya is a special preparation which is made by five by products of cow along with certain other incubated for specific period in an earthen pot or plastic containers. In Sanskrit, panchagavya means the blend of five products obtained from cow – these are cow dung, cow urine, cow milk, cow curd and cow ghee in 5:3:2:2:1 ratio. Sanjeevani is the fermented mixture of cow dung, cow urine and water in the ratio 1:1:2 respectively. There are various types of Sanijevani like Bijasanjivani (1:1:5), Paudhsanjivani (1:1:10) etc. There were statistically significant variations in all types of microbial population under study both in case of panchagavya and sanjivani. The microbial population dynamics has been changed with the increase of time of decomposition upto 10 days of decomposition. For getting better result we should not go beyond 15 days of decomposition for both the bioinoculam to get considerable effect on the plant and soil health. In this case of PSB and Azospirillum was maximum in charcoal based preparation and microbes were highest in liquid based preparation. For all of the microbes liquid based preparation found best at different days after decomposition for different microbes. The worst combinations i.e both control and charcoal based preparation in 77 days of decompositions. Organic carbion percentage was increased with the increase of the decomposition time. No significant changes were found with respect to available P% during the decomposition period. Though available K% varied at different time of decomposition.

SA-55: **A study on shelf life and Biochemical analysis of *Kunapajala* and *Shasyagavya*– two important organic liquid manure**

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Sanskrit word 'kunapa' means smelling like dead body, stinking and 'jala' means water. So kunapajala means dead body like odour water. This was prepared and used in agriculture science ancient times. This liquid manure is prepared by dung, urine, animal waste, water in 1:1:1:2 ratio respectively. Sasyagavya is the fermented mixture of dung, urine, vegetables waste and water in the ratio of 1:1:1:2 respectively. Two important bioinoculams i.e *Kunapajala* and *Sasyagavya* were

evaluated with respect to different types of microbial population from first day of decomposition to 77 days after decomposition. At different time of decomposition all types of microbes were significantly different for both *Kunapajala* and *Sasyagavya*. Mean microbial counts in *Kunapajala* for all types of microbes were irregularly changed during different time of decomposition Mean microbial counts in *Kunapajala*. But in case of *Sasyagavya* the changes of populations dynamics in microbes were more regular and it was increased upto 22nd day after decomposition for total bacteria and total fungal counts. The colony forming unit of *Rhizobium, Pseudomonas, Azospirillum* were maximum on 9th day, after 9days of decomposition. But PSB after 23 days and *Azotobactor* after 14 days of decomposition showed highest colony forming units. When two different factors i.e time for decomposition and the treatments i.e different carrier based preparation like charcoal(solid), glycerine(liquid) and control (with charcoal and glycerol) were considered, then the interaction between these two factors were statistically significant for most of the microbes in *Kunapajala*. For Pseudomonas and Azotobactor in *Kunapajala* the interaction between time of decomposition and treatment was insignificant. The interaction between the above mentioned two different factors was insignificant for most of the microbes in *Sasyagavya*. The results indicated that the carrier based preparation of liquid organic manure like *Kunapajala* and *Sasyagavya* might be helpful for increasing the shelf-life. With the increase of time of decomposition *Kunapajala* showed alkaline nature in all cases, whereas *Sasyagavya* exhibited neutural pH (having alkaline tendancy) in all cases under observation. Unexpectedly, higher E.C ranges between 12 and 26 were found in *Kunapajala* but not in *Sasyagavya*. No remarkable changes were found with respect to organic carbon percentage, available P% and available K% in both *Kunapajala* and *Sasyagavya* with increase in the decomposition period.

SA-56: **Effect of *Sanjibani* and *Panchagavya* on yield and yield contributing characters of different crops and soil health**

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Panchgavya (3%) and *Sanjibani* (10%) were prepared and a field trial was conducted in RBD with three replications along with control plots. The crops on which the experiment was conducted to study the effects of *Panchagavya* and *Sanjibani* on yield and yield contributing characters were Paddy, Greengram and Mustard. Yield record as well as economic analysis proved the efficacy of both the treatments over control. All the characters under study excepting plant height and spike diameter were statistically insignificant in paddy. Productivity per unit of land was highest in Sanjibnai treated plot, followed by Panchagavya treated plot and then the chemical plot. In comparison to chemical plot, Sanjibani treated plot gave additional net return (per acre) of Rs.7470 whereas for Panchagavya treated plot it was only Rs 4600. The yield contributing characters like plant height, no of braches/plant, no of siliqua/plant and 1000 seed weight were statistically significant. Biochemical analysis of soil showed that within one and half year there was a significant increase in available phosphorous, potassium and total microbial count of the organic plot.

SA-57: **Eco-friendly management of crop pests by botanicals, boirationals and home-made pesticides**

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The present work includes results of seven experiments conducted by using plant extracts and biorationals towards causing mortality of different pests mostly infecting medicinal plants in the Ramakrishna Mission Ashrama, Narendrapur. The extract of Pudina and Ramtulsi leaf appears to be causing mortality of less than 50% against *Spodoptera litura*. The extract of Neem leaf also caused mortality of less than 50% against *Aphis gossypii*. The extract of NSK against mite pest, *S. baltazari* registered mortality over 60% and appeared to be promising one. The use of fermented cow urine and water (1:1) appeared to be a good pesticide against Red Cotton Bug and causing about 90% mortality. The Green Chili and Garlic mixture against *Aphis gossypii* and extract of Tulsi leaf against Mealy bug recorded mortality of more than 73% and appeared to be good pesticides. The overall conclusion is that, most of the plant extracts and biorationals used proved pesticidal properties though in varying degrees.

SA-58: **A Study on seasonal dimension of livelihoods in selected village of Purulia district, West Bengal**

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Sustainable livelihoods of rural poor have been at the centre of practical interest for the last one and half decade. However, vulnerability context of livelihoods has received less attention than the livelihood assets, especially in academic studies. Seasonality is an important form of vulnerability that affects livelihood security of rural poor living in stressed ecosystems. To explore different types of seasonality and study the differential perception of rural people regarding the ill effects of such seasonality on livelihood security, the present study was conducted at randomly selected Lagdah Gram Panchayat of Purulia-I Block, Purulia District. Information related to seasonality and villagers' perception was generated through participatory rural appraisal and sample survey through semi-structured interview schedule respectively. Representation from all well-being groups of the village during personal interview was ensured through proportionate stratified random sampling. The study identified 20 types of seasonality related to weather, natural resources, food and work availability, diseases, migration, indebtedness etc. Communality was observed among the seasonal pattern of rainfall, water regimes, fodder and bathing water availability; similarly, work, food and fuel availability pattern was also found to be synchronized. Analysis of peoples' perception regarding the effect of seasonality on livelihoods showed wide variation among

different well-being groups of the community for temperature, leafy vegetables availability, fuel and work availability, availability of water living mollusk etc, indebtedness and hunger being the most important types of seasonality. Difference was also found in their coping strategy against such vulnerabilities. The well-off villagers considered rainfall, human diseases, road condition, water regime as most important seasonality, while the villagers of lower well-being groups considered availability of water living mollusk, work availability, hunger, and indebtedness as more important vulnerabilities. It was also found that importance of different types of seasonality on livelihood security was different when compared against the categories of respondents' background variables. Most important of such background variables were occupation and land holding. The results from the study may be used to identify targeted intervention for rural people in different seasons of the year to reduce their vulnerability and improved sustenance of livelihoods.

SA-59: **Comparative efficacy of different herbicides for weed management in transplanted *Kharif* rice**

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A field experiment was conducted at Central Research Farm (New Alluvial Zone), Gayeshpur, Nadia, West Bengal during the *kharif* season (2009) on sandy clay loam soil having a pH of 6.9 to study the comparative efficacy of different herbicides for weed management in transplanted *kharif* rice *vis-à-vis* to develop a safe farmer's acceptable economic method of chemical weed control. Eight treatments (including hand weeding treatment at 20 and 40 days after transplanting and unweeded control) were tried in a Randomized Block Design (RBD) with three replications. The variety of rice used in this experiment was IET-4786 (*Satabdi*). The predominant weed species in the experimental field were *Echinochloa crusgalli*, *Cynodon dactylon* and *Leersia hexendra* among grasses, *Cyperus rotundus*, *Cyperus iria*, *Cyperus difformis* and *Fimbristylis littoralis* among sedges and *Alternenthera phyloxeroides*, *Monochoria vaginalis, Marsilea quadrifoliata, Ludwigia parviflora* and *Eclipta alba* were predominant among broad leaved weeds. The experiment result revealed that hand weeding twice at 20 and 40 DAT gave the highest grain and straw yields (4.77 and 6.03 ton ha^{-1} respectively), which, however, statistically at par with the treatment Imazosulfuron 10% SC @ 100 g a.i. ha^{-1} applied at 5 DAT. This herbicide offered promising control of all categories of dominant weeds and finally gave highest grain and straw yield (4.55 and 5.68 ton ha^{-1} respectively), exhibiting no phytotoxicity symptoms to the rice crop. The second highest dose of Imazosulfuron 10% SC i.e. @ 60 g a.i. ha^{-1} also resulted promising grain and straw yield (4.27 and 5.31 ton ha^{-1} respectively). Thus it leads to a conclusion that the tedious, time consuming and costly hand weeding method can profitably be replaced by the application of Imazosulfuron 10% SC @ 100 g a.i. ha^{-1} at 5 DAT, which has been found to be the most cost saving and a safe weed control treatment. Imazosulfuron 10% SC @ 60 g a.i. ha^{-1} at 5 DAT is also promising in obtaining higher grain yield by controlling weeds at a satisfactory level can be considered instead of hand weeding twice with respect to benefit : cost ratio.

SA-60: **Physiological behaviour of *Azospirillum sp.* isolated from different host crops**

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With an objective to study the physiological behaviour of local *Azospirillum* inoculates the experiment was carried out at Divyayan Krishi Vigyan Kendra, Ramakrishna Mission Ahrama, Morabadi, Ranchi, Jharkhand. Five strains of *Azospirrillum* sp. were isolated from roots of paddy, maize, sugarcane, kodo (finger millets) and gora (upland paddy) grown at Chhotanagpur belt of Jharkhand. Isolation of *Azospirllum sp.* was done following the method of Bulow and Dobereiner (1975) and purification of the culture was carried out by frequent transfer to semi solid nitrogen free malate medium in screw capped tubes. The physiological characters like relation to free oxygen, catalase reaction and nitrogen fixing efficiency were studied. All the isolates were found short, vibriod rod in shape, gram negative and motile. No variations were observed with respect to free oxygen and presence of catalase enzyme. Nitrogen fixed (mg ml^{-1}) in culture midea was maximum (13.4) in ASS-2 and that was minimum (8.0) in ASR-5. Both FYM + soil (1:1) and vermi compost + soil (1:1) exhibited similar performance as carrier materials.

SA-61: **Integrated farming systems for sustainability under Terai region of West Bengal**

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The growth rate in agriculture during the recent past is in a very slow pace in spite of the rapid economic growth in our country. The trend in productivity of major crops is either static or declining during the X Five year plan. There is no scope for further increase of net sown area and the present scenario indicated a slight shift of area for other purposes like industrialization and urbanization. To sustain a positive growth rate in agriculture, a holistic approach is the need of the hour. The goal of sustainable agriculture is to conserve the natural resource base, protect the environment and enhance prosperity for a longer period. Farming systems is a set of agro-economic activities that are interrelated and interact among themselves in a particular agrarian setting. There are 115 million operational holdings in the country and about 80 % are marginal and small farmers. To fulfill the basic needs of household including food (cereal, pulses, oilseeds, milk, fruit, honey, meat, etc.), feed, fodder, fibre, etc. warrant an attention about Integrated Farming System (IFS). Undoubtedly, majority of the farmers are doing farming since long back but their main focus was individual components and not an integration. Lot of efforts have been made aiming at increasing the productivity of different components of farming system like crop,

dairy, livestock, poultry, piggery, goat keeping, duckery, apiculture, sericulture, horticulture, mushroom cultivation etc. individually but lacking in their integration by following farming system approach. Integrated Farming Systems (IFS) seem to be the possible solution to the continuous increase of demand for food production, stability of income and improvement of nutrition particularly for the small and marginal farmers with limited resources. Integration of different agriculture related enterprises with crop activity as base will provide ways to recycle produces and waste materials of one component as input through another linked component *viz*. the fodder fed to the cattle producing milk. The dung, urine and litter produce farmyard manure and energy used for crops and fish pond. The siltation of fish pond is utilized as manure to crops. The farmyard manure can substitute about 25% of recommended N P and K for crops, besides improving the physical and biological properties of soil. The fish pond water can be used by gravity method while there is breakdown in electricity supply. Oilseeds provide nectar for honeybee, edible oils for human and oilseed-cake for animal feed which will reduce the cost of production and will finally enhance the total income of the farm.

SA-62: **Fertilizer requirement of summer groundnut (*Arachis hypogaea* L.) after harvesting of preceding crop potato (*Solanum tuberosum* L.) in New Alluvial zone of West Bengal**

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The present investigation was conducted at District Seed Farm, Kalyani, Bidhan Chandra Kristi Viswavidyalaya, Nadia, West Bengal during the summer season of 2009 to study on the fertilizer requirement of summer groundnut (*Arachis hypogaea* L.) after harvesting of the preceding crop, potato (*Solanum tuberosum* L.) in New Alluvial Zone of West Bengal. The experiment was laid out in split-strip plot design for first crop potato, where 2 dates of sowing in main plot (D_1- 18.11.2009 and D_2 -28.11.2009); 3 varieties (V_1- *Kufri Pukhraj*, V_2 -. *Kufri Chandarmukhi* and V_3 -*Kufri Jyoti*) in sub-plot treatments and 2 fertilizer doses F1 (200:150:150 kg/ha of N: P_2O_5 and K_2O) and F_2 (150:125:125 kg/ha of N: P_2O_5 and K_2O) in sub-sub-plot was maintained. Each sub-sub plot treatments in potato was again subdivided into four plots, wherein four levels of fertilizers *Viz*., F_0 = No fertilizer; F_{25} = 25 % RDF (Recommended Dose of Fertilizer); F_{50} = 50% RDF and F_{75} = 75% RDF were given to groundnut. The experiment was laid out in split-strip-strip plot design and was replicated thrice. The highest pod yield of succeeding crop, groundnut, was obtained with 50 % of RDF applied in preceding crop potato in F_1 fertilizer treatment. Thereafter, pod yield decreased with further increase of the fertilizer level. The maximum gross return (Rp93840.00), net return (Rp63506.00) and BCR (3.09) were found maximum with the treatment $D_1V_2F2_1F4_3$, followed by $D_1V_2F2_1F4_2$ (Rp91140.00, Rp61520.00 and 3.08 respectively).

SA-63: **Response of potato (*Solanum tuberosum* L.) cultivars under different dates of sowing and fertilizer doses in New Alluvial Zone of West Bengal**

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The field experiment was conducted at the District Seed Farm, 'AB' block at Bidhan Chandra Krishi Viswavidyalaya, Nadia, West Bengal during *rabi* season of 2009-10 to study on the response of potato (*Solanum tuberosum* L.) cultivars under different dates of sowing, variety and fertilizer doses in New Alluvial Zone of West Bengal. The experiment was laid out in split-strip plot design where 2 dates of sowing in main plot (D_1- 18.11.2009 and D_2 28.11.2009), 3 varieties (V_1- *Kufri Pukhraj*; V_2 - *Kufri Chandarmukhi* and V_3 - *Kufri Joti*) in sub-plot treatments and 2 fertilizer doses F_1 (200:150:150 kg/ha of N: P_2O_5 and K_2O) and F_2 (150:125:125 kg/ha of N: P_2O_5 and K_2O) in sub-sub-plot. The recommended dose of fertilizer (RDF) was 20:60:40 kg/ha of N: P_2O_5 and K_2O. Dry matter accumulation of potato tubers increased with the age of the crop and no significant result was observed among the dates of sowing. Maximum dry matter accumulation was found in the variety *Kufri joti* in all the growth stages of the crop and highest (615.65g/m^2) was recorded at harvest under higher fertilizer level (603.59g/m^2). Good harvest of the potato tuber (27.60t/ha) was found under the first date of sowing (18.11.2009) in early variety (maturity 82 days) *Kufri Pukhraj* ((29.80 t/ha) along with higher doses (F_1) of fertilizer (27.79 t/ha). The maximum gross return (Rp97050.00), net return (Rp34289.00) and BCR (1.54) were achieved with the treatment $D_1V_1F_1$.

SA-64: **Plant species diversity of homestead gardens and their contributions in household food security, nutrition and livelihoods of rural poor: a study from South 24-Parganas district of West Bengal, India**

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Homestead gardens are important source of plant species diversity apart from providing nutrition and livelihood support to rural people. This land management system is of special interest to poverty stricken stressed ecosystems where most of the small and marginal farmers or landless labourers operate. A homegarden based planning is required for conservation of local germplasms, food and nutritional security, and livelihood sustenance of rural poor. The present study was conducted in 10 villages selected through maximum diversity sampling from South 24 Parganas district of West Bengal, India, to classify the existing home garden systems, to study

their plant species diversity and its contribution to the food security of the rural poor. Ninety seven plant species of different use were recorded from the homegardens with significant difference in plant species diversity among study villages. Home garden classification on the basis of age, size and diversity revealed that 51.6% of the homegardens were less than 16 years old; 83.3% were less than 0.11 ha in size and 68.3% had low to medium plant species diversity, which significantly varied among study villages. Factors like religion and poverty status also affected plant species diversity in the studied home gardens. However, other background variables were not found to be correlated with it. It was also found that plant species diversity, like home garden size and age, influenced the food security status of households. The findings of the study may be used for home garden based livelihood planning for the rural poor and enhanced in-situ plant species conservation in the Sunderbans region.

SA-65: **Integrated Organic Farming System Approach for Sustainable Agricultural Development of West Bengal**

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The magical word sustainable Agriculture is used by United nations has becomes a buzz word meaning development of agriculture without hampering future ecology. This envisages organic farming and Integrated Farming System Approach (FSA). Farming system represents an appropriate combination of farm enterprises viz., cropping system, horticulture, forestry, livestock, fishery, poultry and the means available to the farmer to raise them profitably. In West Bengal we found some of the diversified organic practices in Agriculture. Codex Alimentarius Commission, a joint body of WHO/FAO, defines "organic agriculture as a holistic food production management system, which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity". The role of organic farming in India as well as in West Bengal is leveraged to mitigate the problems of over exploitation of natural resources. Major impacts observed in FSA are better nutrition, security of income, efficient use of resources, reduction in migration, higher economy and sustainability in production.

RURAL HEALTH AND EDUCATION

RHE-01: **A study of pregnant mothers of rural areas - a comparison of two villages in West Bengal**

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This paper analyses the condition of women in rural areas in pregnant and post pregnant conditions. It has been evident in rural areas that women generally remain malnourished due to low food intake. The reasons for less food intake has been analysed during various periods of pregnancy. It may also be possible that less food intake has been due to diseases suffered by the pregnant mothers. So during pregnancy of first, second and third children diseases suffered by mothers has been analyses During pregnancy, visit to health centres does not also takes place by many of the mothers. So visit to health has also been taken. During pregnancy the mother has to take various kinds of vaccination for prevention of diseases. Among the vaccines tetanus has been important. The paper tries to focus the proportion for mothers taken all the three doses of tetanus vaccination. The paper also analyses the difficulties faced by the mothers at the time of birth of children

RHE-02: **Management of rural sanitation and the Millennium Development Goals: exploring the dynamics**

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Lack of sanitation is one of the single biggest challenges being faced by the world today. This silent global crisis constitutes an affront to human dignity on a massive scale causing widespread

damage to human health and child survival prospects; social misery especially for the women, the elderly and for the sick; depressed economic productivity and human development; and pollution to the living environment and water resources. The United Nations declared 2008 to be the International Year of Sanitation. An enormous amount of resources has been expended on providing sanitation facilities, yet still over 2.5 billion people globally do not have access to basic sanitation services. As far as the scenario of India is concerned, despite an investment of more Rs. 6 billion and construction of over 9 million latrines in rural areas, rural sanitation grew at just 1% annually throughout the 1990s and the Census of 2001 found that only 22 per cent of rural households had access to a toilet, with combined rural and urban coverage as 36.4 %. There were many factors contributing to the low coverage of rural sanitation; it is now widely recognised that community participation was insufficient in this conventional, supply-driven, subsidy-oriented, government directed programme. This paper will be focusing on the importance of sanitation in the context of achieving millennium development goals (MDGs) as well as will explore the current scenario and dynamics of rural sanitation sector of India. Lastly this paper will conclude by suggesting some strategic interventions and approaches for ensuring a better progress and effective management of rural sanitation in India.

RHE-03: **Factors responsible for poor health and nutritional status of the children in Sonarpur Block, South 24 Parganas, West Bengal**

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Child is the core of any development. But they face severe health hazards and malnutrition during 0-5 years of age. Child health is a critical issue of concern to everyone, especially in developing country. The present study was conducted to find out the major health and physical sufferings of the children and identify possible reasons responsible for their poor health and nutritional status. Also to know about the varieties and nature of the diseases and latest immunization status of the children and to identify the differences of child care practices between village and Municipality area under the same block. The study was conducted in South 24 Parganas District of West Bengal. Present researchers conducted their work in 2 GPs and 1 Municipality areas of Sonarpur Block that was Banhoogly–I GP, Langalberia GP, and Rajpur Sonarpur Municipality. Block, GPs, Children, Mothers and other stakeholders were purposively selected. Total sample size was 111 where adopted methods were observation, interview, case study, FGD. Adopted tools were semi-structured interview schedule. The result showed that Diarrhoea, Dysentery, Fever-Cough and Cold cases were very much frequent in GPs than Municipality area in a year. In Municipality area, parents of the children are much more concerned about the treatment about diarrheoa and dysentery. They were aware about the safe drinking water and had the knowledge about hygienic practices. Due to lack of awareness about hygienic practices 33% children used toilet and 67% children did not used toilet yet. Forty six percent children used mud for cleaning hands after toilet, only 15% children used soap for that purpose. Forty one percent of mothers initiated breastfeeding after 12-15 hr due to physical weakness and only 15% of mothers initiated breastfeeding after 1 hr.

RHE-04: **Current health scenario in rural India**

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India is the 2nd most populous country in the world, next only to China. Rural people are facing various problems of rural health. About 75% of health infrastructure, medical man power and other health resources are concentrated in urban areas where only 28% population live there. The birth rate and death rate are relatively higher in villages. Due to their illiteracy the rural people neglect their health and do not take proper medical advice when required. Rural women rarely complain of diseases and prefer to suffer than to go for medical check–up and advice. The diseases such as diarrhoea, typhoid, malaria, tuberculosis, whooping cough dominate the mortality pattern, especially in rural areas. Non–communicable diseases like cancer, mental illness, diabetes, HIV/AIDS are also in rise in rural India. The ill equipped primary health centers are also not able to give medical assistance whenever it is required. Though government has sent huge amount of money for improving rural health, the progress achieved in this field is far from satisfaction. It is evident that the Indian villages are facing number of problems. The problems are not, however, equally found in all the villages. There are villages quite advanced, in such villages many of the problems mentioned above are not found. But villages in the remote corners are full of problems. It is necessary to study these problems in a scientific manner to find suitable solutions for them. Study of the Indian villages is a need of the hour especially by the rural sociologists and rural economists. It is a matter of regret that no systematic and comprehensive study of these problems of the villages on an all-India basis has been made so far.

RHE-05: **Patients and their evaluation: a case study of Burdwan Medical College Hospital**

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Analysis of the referral system is of utmost important for a complete analysis of the rural health care system considering that moving from lower order services to a higher order services is a conscious move. A bare bone structure of health care referral chain explains PHC at the bottom to MCH at the top as apex institution along with rural hospital and sub-divisional hospitals as intermediate facilities. Published time series data on the referral system shows an increasing trend in referring out patients from lower order services to higher order services. This provides a crucial indicator for un-met demand for services. Analysis of this data also shows an increasing trend. Being MCH at the top of the system, it is required to analyze to services provided by the MCH. Exit interviews are conducted randomly among the discharged patients to evaluate the outcome of service provisioning where pre-service perception and post-service experience on select indicators on the output measures are compared through 10-point rating scale. Wide gap is found in the pre and post rating situation. Pre-service opinion has a higher level of convergence compared to the post-service opinions. The study further extended to identify the lacunas through conducting interviews on input to create the services with 10 point rating scale among

the service providers – doctors, nurses and technical support staffs. The input indicators encompass infrastructure, support services and institutional effectiveness for synchronization of services. High level of convergence is observed among the doctors' opinions. The outcome of the survey result suggests the required policy actions for an effective rural referral system.

RHE-06: **Rural Health**

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In this paper an attempt is made to give an overview of rural health in India, as well as essential aspect of their environment. India is a multi-ethnic, multi-linguistic and multi-religious state. Most of the people who are at disadvantage due to nutritional handicaps are found in rural areas. India is the second most populous country of the world and has changing socio-political-demographic and morbidity patterns that have been drawing global attention in recent years. Despite several growth-orientated policies adopted by the government, the widening economic, regional and gender disparities are posing challenges for the health sector. About 75% of health infrastructure, medical man power and other health resources are concentrated in urban areas where 27% of the populations live. Contagious, infectious and waterborne diseases such as diarrhea, worm infestations, measles, malaria, tuberculosis, whooping cough, respiratory infections, pneumonia and reproductive tract infections dominate the morbidity pattern, especially in rural areas. However, non-communicable diseases such as cancer, blindness, mental illness, hypertension, diabetes, HIV/AIDS, accidents and injuries are also on the rise. The health status of Indians, is still a cause for grave concern, especially that of the rural population. This is reflected in the life expectancy (63 years), infant mortality rate (80/1000 live births), maternal mortality rate (438/100 000 live births); however, over a period of time some progress has been made. To improve the prevailing situation, the problem of rural health is to be addressed both at macro (national and state) and micro (district and regional) levels. This is to be done in a holistic way, with a genuine effort to bring the poorest of the population to the centre of the fiscal policies. A paradigm shift from the current 'biomedical model' to a 'sociocultural model', which should bridge the gaps and improve quality of rural life, is the current need. Health and poverty may be presumed to share a synergistic and bi-directional relationship, wherein poverty exasperate ill-health, leads to lower food consumption and besides compromises some power determinants, such as housing and utilization of education and medical services while ill-health diminishes labour productivity.Globalisation has also affected positively and negatively in rural areas.

RHE-07: **A review of rural health scenario of India, particularly West Bengal – with special case study on female and child health status in rural areas along Barasat-Barrackpore Road**

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According to the recently published N.R.H.M. reports, the District health plan, which reflects the convergence with wider determinants of health like drinking water, sanitation, women's empowerment, child development, adolescence, school education, female health and hygiene,

the target set as-30% by 2007,60% by 2008 and 100% by 2010. According to the W.H.O. report-2009-in 2007, there were an estimated 9 million child deaths, significantly fewer than the 12.5 million estimated in 1990, with a 27% decline in the under-5 mortality rate over that period to 67 per 1000 live births in 2007. Reducing child mortality increasingly depends on tackling neonatal mortality; globally, an estimated 37% of deaths among children under five occur in the first month of life, most in the first week. Every year 536 000 women die of complications during pregnancy or childbirth, 99% of them are from developing countries. In West Bengal birth rate is 18.8/1000 live births, where the I.M.R. is 38/1000 live births. Not only that, the ratio of physisian/ person is 1117/Doctor. Present paper contains the review of the rural health scenario of our country, putting emphasis on our state with a special sample case study on rural female and child health in few rural portions along Barasat-Barrackpore roadway, North 24 pgs, accompanied by possible wayouts to improve the scenario.

RHE-08: **Strategies for effective utilization of women and child health care programme in rural area**

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Women's unequal access to resources including health care is very well known in India in which stark gender disparities are a reality. Reproductive life is a very personal, private and forbidden subject in our society. Government continued many development programme with the major objective of raising their economic and social status and bringing them into mainstream of national development. Among the various programmes/services run by the government for the development of rural women and child, Integrated Child Development Services (ICDS) scheme is of great importance. The study was conducted in two states viz. Haryana and Rajasthan. Seventy five pregnant or lactating (child of the age upto one year) rural women in the reproductive age group of 15-45 years were randomly selected from the selected cluster of villages in each district. Proposed strategy is based on the salient findings emanated through analysis of research data and review of literature. On the basis of findings strategy was proposed, if implemented judiciously, would strive to help in improving health programme/services and their utilization at the grassroot level.

RHE-09: **Health care and personal care practices of women (adolescent onwards) of a tribal village, Mudidihi, Purulia, West Bengal**

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The health care and personal care is very much related with the health hazards, the poor tribal women use to suffer from different diseases due to lack of health awareness and unhygienic practices. The researchers were keenly interested to find out the trend of adoption of modern health and personal care along with their traditional practices for developing an idea about the reasons behind the physical sufferings of such women. A specific tribal group living in the

Mudidihi village, Purulia, West Bengal were selected by the researcher where total enumeration technique was followed for the selection of the respondents. The objective of the study was to study the health and personal care practices of the women of concerned village, to know about their health awareness, to understand the reason behind adoption and rejection of modern health assistance, to know about the practicing of tribal medicine and impact of superstitious believes and practices, to minimize the health sufferings of women (adolescent onwards) and to accelerate the use of modern health care practice among them in future. Data collected from 38 adolescent girls, 66 middle aged and 19 old aged women through personal interview, focus group discussion and case studies showed that the entire health care and personal care practice among the tribal women of Mudidi mainly depended upon their ages. The elder ladies liked to depend on traditional medicine where as the middle aged and younger women were more prone to modern health care and personal care practice. Use of cosmetic, soaps etc were very often found among the young and middle aged women. Superstitious beliefs and practices were observed to some extent. All the pregnant women used to go to hospital for anti-natal treatment and delivery. Fifty two percent of the adolescent girls, 45% of the middle aged women and 3% of old aged women used soap after toilet and after taking food, which indicated more positive changes among the present generation in comparison to elder generation. It was resulted due to the intervention of Kalyan (NGO) and Government health support for the tribal of the village.

RHE-10: **Rural development through health and education management system**

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Govt. of India have taken so many initiatives and many programmes and projects for rural development in the area of health and education system for rural peoples but still facing so many problems and consequences. Health and education are defining sectors for equitable human development and sustainable and inclusive economic growth for India. Challenges are also increasing for rural development in terms of health and education systems, especially for the poorest and those located far from the reach. This paper basically tries to attempt to give comprehensive details of the rural development programmes in health and education management system. The overall conclusion of this paper is positive: the system does provide a more coordinated implementation. However, continuous monitoring and evaluation should be strengthened; and additional technical training in development planning is needed.

RHE-11: **Co-existence of indigenous and western health care system: a study in Rishi Bankimchandra GP, Kakdwip Block, South 24 Parganas, West Bengal**

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Objective: Recognizing the importance of traditional health care system as well as modern health care system and its important factors in identifying disorders, distress patterns, health seeking behavior, and interfering efforts to seek useful help, this study examined indicators of various

health problems based on local cultural epidemiology among the common people and health care providers (HCP) of various kinds in a rural community of Kakdwip Block of South 24 Paragnas.

Method: Interview schedule was administered to a random sample of 87 common people of Rishi Bamkimchandra Gram Panchayat. These interviews examined several indicators of the following health problems: Bhutali, Kamla (Juandice), Pox, Hum (Measles), Fever, Cold and Cough, and Conjunctivitis. Case vignettes eloquently depict typical presentation of the views of health care providers of various kinds.

Results: From the responses, the study examined the dichotomy between different stigma level denoted by common people as well as the health care providers. Statistical interpretation of different symptoms established that male and female prioritized them according to their importance. The stigma level was also high for health care providers as well as for the common people regarding local cultural epidemiology. Conclusion: stigma is a great impediment to detect disease and treatment is influenced by social stigma including mystical mentality, poverty, access, and acceptance. The high level of stigma occupied by the health care providers indicated that the health awareness programme and skill development programme need to be targeted for them as well as for the common people. Overall, the findings of this study would contribute to provide useful designing for harnessing inclusive health care system.

RHE-12: **Status of tribal health in Orissa: an economic analysis**

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Health is a vital livelihood asset and a prerequisite for the well-being of the mankind. Caused by several economic, social and institutional impediments, many tribal concentrated regions in the Indian state of Orissa still experience to languish in abject poverty with meager health status. The health condition of these tribal areas, which are largely untouched by the ongoing developmental processes, is very poor because of some multidimensional factors like lack of health awareness, superstitions, poverty and deforestation. The present study is based on both primary and secondary data. The secondary data sources are Sample Registration System (SRS) Bulletin, National Family Health Survey-2 (NFHS-2) and other reports. To supplement the findings, primary data collected from three sample villages of the Kandhamal district of the state have been used, and the villages were purposively selected on the basis of concentration of tribal (ST) population and geographical location. This paper examines the general health condition of the tribals in the state vis-à-vis in the sample villages and presents some of the common features and problems of the tribals to know the social and regional dimensions of health status in Orissa. Finally, it suggests several progressive measures for effective coverage of national health and nutritional services in the tribal areas.

RHE-13: **HIV/AIDS: as perceived by rural adolescent students of Dhrubachand Haldar College, Bireswarpur College and Patharpratima Mahavidyalaya, South 24 Pargana, West Bengal**

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HIV AIDS is a burning social problem. The disease cannot be cured; thus emphasis was given to preventive part. India ranked second (after China) in the number of population and it also ranked second (after South Africa) in the number of HIV victims. Interestingly, in India some social stigma, prejudice, misconception is present leading to social problem regarding HIV/AIDS. To eradicate HIV/AIDS in India AEP programme was launched by the Ministry of Human Resource Development to educate the school students, but this programme did not reach to every schools and colleges. Thus the present researcher conducts the research work on three colleges based on the in distance from Kolkata. These three collages are i) Dhrubachand Haldar College (near Kolkata) ii) Patharpratima Mahavidyalaya (far away from Kolkata) and iii) Bireswarpur College (in between these two college). Some specific objectives of the study were to identify the perception of rural adolescents, to understand the existence of social stigma related to HIV/AIDS, to know the sexual habit of girls and their concept of biological relation, to know about the concept of safe sex, to know the attitude of the student towards HIV/AIDS and it victims, to make a comparison between the aware collage and unaware college. Data were collected from 160 students from these three colleges including 90 boys and 70 girls. The results which come out from the research revealed that most of the students were unaware of the fact related with HIV/AIDS. Some observed social stigma were it is contagious, it is incurable, HIV victims should be isolated from the society, and before marriage having sexual relation leads a person to the disease etc. Surprisingly it was found that awareness camp was organized in Patharpratima College which helped to aware the students of this area. Still some stigma prevailed in the mind of other two collages. Their shyness and fear leads them towards a black day where only education could give a single ray of hope.

RHE-14: **Sishu Siksha Karmasuchi: an alternative primary education system**

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There are several rural areas where all children do not have access to primary school because of physical distance or geographical obstacle or may be in Government aided conventional primary schools the accommodation and the teacher strength are not enough to cater to the needs of the students. To serve those learners, Department of Panchayats and Rural Development, Government of West Bengal introduced a unique system of education named Sishu Siksha Karmasuchi which is being implemented in the district as an alternative method of primary

education for the children in 5-9 age group. It differs from a formal government school in the sense that it targets the difficult to reach children catering to their specific needs through flexibility in terms of school timings, management by the community with the support of the panchayats, and engaging community teachers who belong to the same community as the children. Education is imparted by teachers called Sahayikas who are generally women with minimum qualification of madhyamik passed. SSK is a demand driven programme and also low cost non formal education system that aims to universalize access of primary education and ensure quality education at the primary school level.The system is designed to reach out to hitherto backward and un-served rural areas of state. Starting in 1997 with 410 centers, the SSK has grown to 16,109 centers. 50.29% of all the learners in such kendras are girls. At the present time, learner– teacher ratio of those kendras are 32:8, relatively more than previous year. The article reviews the recent growth and impact of SSK in West Bengal because education is one of the most significant inputs for development. Also, poverty and illiteracy hang together and higher educational attainment of the poor is necessary for faster eradication of poverty.

RHE-15: **Efficacy of the primary education system in India: a district level analysis based on DISE Data**

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Education, as the path to social and economic development, plays a prominent role in strengthening human capital. The most critical stage of this is the primary educational level of a child. The principle institutional mechanism for developing human skills and knowledge is the formal educational system. Most developing nations have been led to believe or have wanted to believe that it is the rapid quantitative expansion of educational opportunities which holds the basic key to national development. The more education, the more rapid the anticipated development. Education is one of the most important services provided by governments in almost every country. This is something, which is very agreeable to most of us, and yet such a scenario seldom meets our eye when it comes to the state of education in India. The Indian constitution enshrines compulsory primary education to all her citizen in the directive principle of state policy. However, inadequate attention is paid to the delivery mechanism of the primary education. This remains a basic Achilles' wheel of the development process in India. In fact this inadequacy has added to injustice and inequality while stunting the prospect of development. In this paper, we study the primary education system of India, using the district level DISE Statistics. We used several indicators to capture the multi-dimensional aspect of primary education system in India. But our analysis reveals certain disturbing features. First, the system is seriously jolted by the lack of adequate resources. Second, discrepancies with regard to social and policy indicators are more or less uniformly distributed. However, resource use efficiency (as measured by DEA) and standard efficiency indicators indicate wide inter-zonal differences. The results from these two approaches are more or less similar. Poverty infringes upon efficiency in a negative way. Social indicators are not related with efficiency improvement. Policy indicator appears to have a negative effect on the level of efficiency.

WOMEN AND CHILD DEVELOPMENT

WCD-01: **Emerging post-globalization challenges for women in agriculture – need for integrated rural development**

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The most distorting trade agricultural policies are in the agriculture sector. The process of globalization and trade liberalization facilitated multi-national corporations to have un-hampered access to the domestic food (and non-food) markets of the countries all over the globe. In the context of India which is primarily a subsistence based agrarian country, globalization implied opening up economies to unequal players globally, allowing control of multi-national corporations to commercialize, privatize, and monopolize production and supply of agricultural crops and seeds, which were earlier in the hands of small scale peasants, mainly women. At local level, **t**here has been a shift from domestic subsistence farming to export oriented and capital intensive, mono-cultural production and contractual farming at a large scale. This market orientation while favouring large-scale commercial farming, has negatively impacted subsistence farming, eroding food diversity and self-sufficiency at household level. It has engendered the very livelihoods of the local producers/farmers, including women, by robbing them of their own local markets and pushing them further into debt and poverty. As a consequence, the most basic human right of all – the right to food and nutritional well being enshrined in the universal Declaration of Human Rights, is not guaranteed to the majority of the world's population. Loss of control over the production has drastically affected women in agriculture, disturbing their work patterns, employment opportunities, incomes, and ultimately the complete household food security system. This has also triggered other social processes like increase in migration, female headed households, increased dependence on casual wage labour, exploitation and increased health risks. The discussion brings out policy implications at the local, national and international levels to achieve the first MDG of eradicating hunger and poverty.

WCD-02: **Extent, pattern, and causes of child labour: a brief comparison of three eastern states of India**

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In India child labour is a 'harsh reality' and one can only mitigate some of the harshness of the exploitative aspects of child labour. The 'harsh reality' of child labour arises out of the fact that in the present state of development in the country many parents, on account of poverty, have to send their children to work in order to supplement their income and the income derived from the child labour, however meager, is essential to sustain the family. In this paper we want to make a brief comparison with respect to the extent, pattern and causes of child labour in the three eastern states of India: Bihar, Orissa and West Bengal. For empirical analysis, we have used the National Sample Survey Organization (NSSO) 62nd (2005-2006) round Unit Level data on Employment and Unemployment Situation in India. Our analysis shows that the extent of child labour is relatively high in Bihar than in Orissa and West Bengal. Among the child labour the percentage of wage labour is highest in Bihar but it is relatively low in Orissa and West Bengal. However, there is no distress child labour in Bihar that is remarkable. In West Bengal and Orissa, a child generally enters the labour market at a tender age than Bihar. However inverted "U" hypothesis of child labour is verified in West Bengal and Bihar but not in Orissa. Increase in wealth initially raises child labour and then it tapers off. Regression result reflects that education of adult male have a negative effect on child labour in West Bengal though not in Bihar and Orissa. Again larger the number of children in the family larger is the pool of child labour. Thus family planning is necessary to reduce the extent of child labour. To summarize the entire situation is really bad in the sampled states. Even after all the regulations regarding child labour, the scenario is very bleak. This cuts out a sad commentary of our public policy and calls for immediate action.

WCD-03: **A study on the implementation of 'Right to Survival' Right of the children through ICDS programme in South 24 Parganas**

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Children are the assets of any nation, future of society and change agents of tomorrow for any country. UNO convention has provided four rights for the children (UNCRC)-one of them is right to survival. The the present study was undertaken to relate the ICDS project with the 'right to survival' right of the children with specific objectives - to identify how far ICDS components are directly related to right to survival, rights of the children in India, to find out the effectiveness of such component for ensuring right to survival to the children. To fulfill these objectives interview, observation and case study were adopted. Findings suggested that 14% of the children were delivered at home that was very much risky as per as the mother and child health was

concerned. Still, 40% children did not want to attend the ICDS centre because at that time they liked to play; the negative attitude of the ICDS workers towards children and physical torture against such children were also some of the reasons for children's unwillingness to attend the ICDS centers. Nine percent of the children had not been immunized because of their parents fear about the side effects of the vaccination, which include fever, cough and cold. The ICDS workers had not properly sensitized the parents as well as the villagers about the importance of registration, immunization, family planning. Most of the centres did not organize mothers meeting regularly. Only 35 % stakeholders were aware of the child rights. Though they were working with the child, no such initiatives were taken up for their awareness generation about child rights, which are very important for service generation.

WCD-04: **Comparative study on gender discrimination by rural mothers**

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Gender is an important variable in all human interactions. It plays a crucial role in all the activities in life. From childhood, girls are encouraged to take the traditional female roles. The girl child, as all of us know is considered to be a less preferred child in our society. She is a victim of social stigma, especially in rural areas. The problem is severe and deep rooted. Keeping these points in view, the present study was undertaken to compare the perception of rural mothers about five selected aspects of gender discrimination {value placed on having child, child rearing (infancy and childhood), adolescent development, autonomy permitted to children of both sexes} of different income groups of selected villages of Bikaner Panchayat Samiti, Rajasthan. A total sample of 60 rural mothers of low income group (LIG), middle income group (MIG), and high income group (HIG) families, who had both sons and daughters (below 18 years of age) of Husangsar and Khara villages of Bikaner Panchayat Samiti, Rajasthan were interviewed using perception inventory to collect relevant information. Frequency, percentage, mean percent scores and mean scores were computed for analyzing the data. It was found that most of the rural mothers of LIG families had practices of gender discrimination in all selected aspects as compared to the rural mothers of MIG and HIG families.

WCD-05: **Women in development: effective role of Self-Help Groups in West Bengal**

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Despite contribution of significant share to national economy and total working hours of the country women are deprived of economic and social status irrespective of religion, race and caste. Their parasitic nature and vulnerable conditions confine them within the boundary of patriarchal dominance. Development programmes for women in the country started since 1980 mainly under the aegis of NGOs. The programme at official level was launched as Development of Women and Children in Rural Areas (DWCRA) under Integrated Rural Development Programme (IRDP).

Women Prosperity Plan was launched on 2nd October, 1993. In tune with Women Prosperity Plan Swarna Jayanti Sahari Rojgar Yojona was launched on 1.2.1997 and Swarna Jayanti Gramin Swarijgar Yojona was launched on 1.4.1999. SJSY helped the poor to form Self-Help Groups on the basis of poverty reduction approach of micro finance. In West Bengal SHGs are mainly formed by rural women. More than 90 percent of SHGs are run by women in the state. Formations of SHGs are facilitated by NGOs, Co-operative Society and Panchayati Raj Institutions. Women in our country as well as in the state were denied access to participation in governance and process of development. Seventy third amendment to the Constitution in 1993 paved the way for women in political process. Rural women hitherto denied to any kind of participation, got entry into politics at grass root level. Formation of SHGs in rural Bengal helped women to change their economic conditions by involving them in production process by optimal use of local resources. Earnings of women through SHGs not only enhance their income and economic share in the family but they are enriched with social and economic status through confidence building measures in the working of SHGs. Government's promotional role in capacity building of members through training acts as support base of the SHGs. Still political interference and bureaucratic indifference towards group members are hindrances to effective development.

WCD-06: **Female workforce participation in Hooghly: a block level study**

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This paper will try to focus on the differences in workforce participation by sex in rural areas of Hooghly district. Women's occurrence in labour market is somewhat blurred and minimal in contrast to that of men due to less access to human capital. In rural areas low opportunities of education, inaccessibility of health and dual work burden as wives and mother often stir up exclusion of females from labour market. Dominance of male workers in rural areas hints at gender inequality and biasness. Empowerment of females and dynamic role in decision making remains dented. Low educational attainments, school dropouts, enhanced domestic burden among females are the inherent cause of widening gap in work participation. However, females belonging to the lower end of economic strata seem to over-represent themselves in farm and non-farm activities to sustain their livelihood although most of them are engaged as, seasonal workers, casual labourers in low skilled jobs and unorganized sectors. This scenario of workforce participation in rural areas of Hooghly signifies the prevalence of economic exploitation, gender injustice and andro-centric ideology.

WCD-07: **Entrepreneurial traits of successful women for adoption of entrepreneurship – case study**

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Women have been associated with economic activity since ages. In India, women entrepreneurship represents a group of women, who are exploring new avenues of economic participation. Initially,

women entrepreneurs perceived as a maker of traditional enterprises but now, with the changing scenario of women's participation in development, women are becoming actual owner and decision makers of non traditional enterprises where there is immense potential for growth and employment generation. Infact, these women possess entrepreneurial traits, which motivate them to adopt entrepreneurship. keeping these rational in mind the present study was conducted in tribal dominated area in Ranchi district of Jharkhand state. A total of 20 tribal women headed enterprise were randomly selected where five different type entrepreneurial activities being practiced viz. – mushroom production, food processing, dairying, stitching and beauty parlour activities. Sixteen different type entrepreneurial traits were considered for evaluation of possession of extent of entrepreneurial traits of tribal women entrepreneurs. The respondents were interviewed and their responses were categorized in three distinct levels with the help of 7 – point scale. Further, data were also statistically analyzed with application of the Cruskal Wallies-H-test to know the difference in possession of entrepreneurial traits of women entrepreneurs of five different enterprises. Analysis of data revealed that majority of respondents (45%) had medium level of traits followed by the respondents who possessed low level traits (30%) and high level traits (25%) which varied with type of entrepreneurial traits irrespective of various enterprises. The overall data on entrepreneurial traits highlighted that majority of respondents possessed high level of decision making ability and skill competence as mean score was noted as 2.5 in both the traits. While other traits viz. – self confidence, competition skill, emotional maturity, change proneness was found to be of medium level having mean score as 2.3 in each. The extent of entrepreneurial traits differed significantly among the various entrepreneurial units. Information related to entrepreneurial profile focused that majority of respondents (65%) were practicing manufacturing type enterprise. The cost benefit ratio of various enterprises varied from 1.1.45 to 1.1.89 which highlights the fact that all the enterprise is quite profitable. Further, on an average economic contribution of these tribal women entrepreneurs was found to vary between 44.08 to 74.48 percent, leading to reflect their entrepreneurial management capability. These successful women entrepreneurs can contribute to their family and national income, which shows that women entrepreneurship has proved to have immense potential for growth and employment generation. Thus adoption of such avenues can serve as an essential ingredient for rural economic development.

WCD-08: **Socio-economic empowerment of women through NGO based micro finance – a case study in Mandya district**

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The poverty in India has a strong gender dimension. In order to develop and empower women, the government has been formulating policies and programmes, which have been operationalised through five year plans since independence. A review of the policies and programmes is undertaken during and at the end of each plan period while preparing plan documents. Such a constant review, based on evaluation and studies conducted on government initiated women

development and empowerment programmes, and the successful programmes of civil society organisations within and outside the country, together with political mobilization of women, have resulted in the following changes - a shift in policy focus from welfare to development and to empowerment during the five-year plan periods, especially after the 1970s; assignment of functions relating to women's development and empowerment to different types of local organisations, line departments, local government, NGOs and others; mandatory representation of women in the decentralized government at the district and below; formation of grass roots level women's organisations for their development and empowerment; and a shift in targeting strategy from 'individual beneficiaries' to 'self-help groups of women involved in micro finance. Micro finance programmes are expected to make a significant contribution to poverty alleviation and empower the members in economic, social and political spheres. NGOs are building social capital in the form of groups that can generate a sound base for their members to develop their credibility as borrowers and encourage financial institutions to develop confidence in establishing a lending relationship with the groups. With this background, the study seeks to examine the functioning of micro-finance programmes, and analyze economic benefits (improvement in livelihoods and access to resources) and social benefits (improvement in knowledge and participation) of the selected micro-finance members in the specific context of NGO programmes in Mandya district.

WCD-09: **SGSY: Is it a tool for empowering women?**

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After the success of the micro-credit scheme of Grameen Bank in rural Bangladesh, micro-credit initiatives for the poor have come to occupy the central place in poverty reduction strategies in developing countries worldwide. Descriptive as well as econometric analyses show that these programmes have positive impacts on income, production and employment, especially in the rural non-farm sector. In this paper the authors wish to discuss the government-initiated micro-credit programmes to analyse the income effect of such programmes. This paper is based on the field experience of INSPIRATION while working for Government of India's "Swarnajayanti Gram Swarojgar Yojana" (SGSY) in Bardhaman District of West Bengal aiming at formulating of and monitoring self-help groups (SHGs) composed of below poverty line persons (BPL), mainly rural women, leading them to income generation activities with government loans. The data collection drew on women's accounts through semi-structured open-ended interviews and questions. Qualitative analysis was useful here for searching for themes and issues raised by respondents. Moreover, non-availability of comprehensive database on impact of micro-credit programmes point to the fact that qualitative in-depth studies should precede more comprehensive procedural and substantive surveys and their analyses. The SGSY scheme is not without limitations. The findings from this project suggest that where women are the targets of programmes, their voices are rarely heard. The government officials tend to rely only on quantitative indicators and as a result of which the programmes give importance to areas other than those, which need to be prioritized.

Again, seeing women as a homogeneous group also creates problems. Thirdly, the essence of SHGs lies in promoting partnership and solidarity. However, in such a process individual entrepreneurship gets discouraged. Panchayat women members seldom are willing to give support to these rural women as facilitators or mobilisers.

WCD-10: **SHG - a change agent for empowerment of rural poor women: a study in Gobindarampur village of Kakdwip Block, South 24-Parganas, West Bengal**

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It is recognized that the process of women empowerment is not self-propelling and needs policy instruments. SHG is a suitable means for triggering such empowerment of women. The Self Help Groups are functioning as the agent of development at the grass root level and the primary units in the development process of the country. The present study was conducted on both SHG and non-SHG members (the respective family members) to examine whether a SHG really act as a change agent for their empowerment or not. The objectives adopted for the study was to analyze the role of Self Help Groups in the social, economic and political empowerment of women; to examine the comparison of perception about women empowerment between SHG members and their respective family members; and to provide effective support and services for making women more empowered in future. The study was conducted in Gobindarampur village of Kakdwip Block, South 24-Parganas District. Total number of respondents were 60, 30 SHG members and 30 family members, all selected purposively. Data collected through group interview and case study revealed that all the women had sense of self-worth after joining the SHG. Twenty percent women were economically self-dependent, where at pre-SHG stage it was only 7%. Twenty one percent of women had increased their problem solving skill regarding their family dispute, emergency situation etc., where at pre-SHG stage it was only 10%. Ninety percent women used to give their opinion and make decision in their family matters which was only 13% in pre-SHG stage. A significant number of women borrowed and spent according to their own choices, which was completely absent previously. In community affairs 90% women were found to be involved which was only 7% previously. In case of ability to control their own lives/fates it was found to be only 27%. There were many other factors responsible for lowering the effectiveness of SHGs viz. illiteracy, lack of proper leadership, lack of proper management, lack of promotion of income generating activities, lack of access to resources and opportunity, lack of freedom and liberty etc.

WCD-11: **Gender development in North 24 Parganas through a nursery scheme**

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A Nursery Scheme was introduced in the district of N. 24 Parganas in 2009-10. It is based on the

Convergence theme and provides an opportunity to promote partnership mode of development. Gradually the NREGS is shifting to this convergence mode for optimal use of resources and creation of quality assets. A study of the SHGs associated with the Nursery Scheme revealed the increasing positive socio-economic impact on these beneficiaries. Initiative for strengthening decentralization through SHG and active participation of women in decentralized planning was another aspect of political participation and development. Women preferred to work at their homes/near their homes so as not to neglect their household duties and family responsibilities. They were satisfied with the time schedule and working conditions. There was a feeling of social security now. Appreciation of work by family members and co-operation from them increased their prestige within and outside their family. There has been an increase in their decision making power. Participation in recreation and social gathering has now increased as objection from family members has reduced considerably. They got suggestions from others when they were in trouble. As a result, they expressed an increase in self confidence now, specially after joining the group. There was an improvement in financial condition and a feeling of economic security now. Inculcating the habit of saving for the future and becoming acquainted with the banking system; having a bank/PO account is an indicator of access to affordable financial services, access to the payment system hitherto unknown to the women earlier. It is also their formal identity. It implies empowerment to the women to take charge of their lives. Such empowerment aids social and political stability.

WCD-12: **Rural women: employment and micro credit plans**

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One of the fundamental development debates is correct and improved utilization of human resources capabilities and talents. Rural women's position as half of rural community's work force has particular importance, which till date has not received its deserved attention in managerial and legal systems. The default belief is that rural women play outstanding community roles in spite of their not fully understood economical, social and cultural status and their high participation rate in many economical, production and service-based activities. They also play an important role in production of various products such as agricultural, horticultural, livestock, hand craft and transformational industries. Their presence in other activities such as decision making, management, ownership, employment and income making, however, is challenging and unfortunately less than their deserved attention is devoted by officials and planners of rural development field due to variety of reasons. One of the approaches to help rural women and to lessen their poverty is taking advantages of their work force in small businesses and micro economic operations. This policy needs financial resources to be spent in developing such occupations.

WCD-13: **SHG and its effectiveness for sustainable growth and development of society: a study in Rishi Bankimchandra GP, Kakdwip Block, South 24 Parganas, West Bengal**

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Recognizing the importance of Self-Help groups as a change agent for socio-economic development of village and it's importanance in sustainable growth and development of society and find out the barriers/discrepancies against sustainable growth and development of SHGs, this study examined the indicators/various reasons behind unsustainable of SHGs based on group members and other stakeholders' views in Rishi Bankimchandra GP of Kakdwip Block, South 24 Parganas, West Bengal. A sample survey was conducted on a randomly selected sample of 110 SHG members, their respective family members and Panchayat members of Rishi Bankimchandra Gram Pnchayat. These interviews examined several indicators of the SHG and its effectiveness for sustainable growth and development of society, namely - reasons behind less attendance, lack of proper leadership, reasons behind non-repayment of loan in time and reasons behind the group defunct etc. Case vignettes depicted the views of the Panchayat members and the other stakeholders associated with SHG functioning. From the responses, the study examined the reasons why SHGs couldn't sustain in an effective way through several reasons like lack of proper leadership due to control over members and communication, less attendance in meetings due to looking after business and involved in household activities, reasons behind defunct the groups due to default in loan repayment, reasons behind non-repayment of loan in time due to business and health hazards etc denoted by SHG members, their selected respective house members and other stakeholders. Sustainability is not a single issue. The SHG members need income generation activities and skill development training. The govt. initiatives, panchayat and NGO should be emphasis on the matter of sustainability of SHGs through monitoring and evaluation and provide a proper linkage between bank and other financial institutions. Overall, the findings of the study would contribute to provide useful designing for sustainability of SHGs in future.

WCD-14: **Gender disparity in literacy in rural areas: a study of Nabadwip Block in Nadia district, West Bengal**

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An attempt has been made in this paper to analyse the gender disparity in literacy in rural areas of Nabadwip Block in Nadia District for the year 2001. Twenty five villages constituting the entire rural areas of Nabadwip Block have been taken in the study. Gender disparity index in literacy of rural areas has been calculated on the basis of the Sophers' *Disparity Index* (1974), as modified by Kundu and Rao (1982). The paper also tries to find out the relation of this disparity with the child sex ratio, percentage of Scheduled Caste and Scheduled Tribe population to total population and occupational structures. Of the twenty five villages, the highest gender disparity in literacy

has been found in Mohisunra village (0.4238) and the lowest in Ghasighata village (0.0580). The gender disparity index in literacy for the entire rural areas of Nabadwip Block has been observed to 0.2002. The study has revealed that the village wise gender disparity indices in literacy have positive correlation with the percentage of Scheduled Tribe population, main agricultural workers, main cultivators and main agricultural labourers to total population. The disparity indices have negative correlation with the child sex ratio, the percentage of Scheduled Caste population, work participation rate, main household industrial workers and non-agricultural workers to total population.

WCD-15: **Livelihood security of women through SHGs with special reference to Bangalore rural district**

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The achievement of SHGs and Government programmes are having a positive impact on the economic empowerment and it increases the role of women in decision making as well as income generating activities. After 2001 which was considered as the "Women Empowerment Year", the rate of participation of women in all the sectors has been considered as an important landmark in the economic development. This has changed the fundamental and structural set-up of our economy. At the same time, the changes in the role of women in various sectors started to influence the Micro Finance. SHGs have helped micro-enterprises set up by women individually or in groups. The examples are-raising vegetables in the land, ready made garments making, developing horticulture and animal husbandry, cultivation of medical herbs, mushroom cultivation, pot making, stone quarrying, sheep breeding and marketing wool, preparation of pickles, canteens in Government office premises, running a minibus, running public distribution outlets and so on. The growth of SHGs and bank linkage programme created initially a lot of impression in the minds of feminist as a tool of reducing "gender inequality" and also reducing poverty. Hence forth, this has received a lot of encouragement by the Union Government, State Government, Department of Women and Child Development, NABARD and various Non-Governmental Organizations. But unfortunately in our country, in many conferences held at national and international level, debated for and against about the impact of SHGs on economic development. Therefore it is the right time to make an empirical evaluation of the impact of SHGs on women participation in literacy, decision making, livelihood security etc., in order to achieve the empowerment

WCD-16: **Female migration: an issue of concern for rural development in India**

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Migration is the barometer of changing socio-economic and political conditions at the national

and international levels. It is also a sign of wide disparities in economic and social conditions between the origin and destination. Migration and development is a growing area of interest. There has been much debate on the negative impacts of migration on development and vice versa. On the one hand, it is argued that underdevelopment is a cause of migration, and on the other hand, prosperity also leads to migration. If one stresses on the issue of gendered perspective to migration, it does not essentially mean that we are ruling out the incidence of the large working force of "male labourers". However what we are doing is merely bringing to light the inadequate attention paid towards the importance of women labourers in the workforce population who form an essential part of the migrant population. Often it is seen that studies done on migration is "Gender Neutral" which systematically drops out the essential components of women's contribution to this work force and hence theories on migration seems largely distorted. This paper makes an attempt to explore the causative factors of migration and the emerging trends and issues of female migration in India. It also reflects the possible impact of female migration on the millennium development goals.

WCD-17: **A study on street children living on railway platform migrated from rural Bengal**

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Present study on the street children living on railway platform, migrated from rural Bengal, concentrated on identifying some specific problems which researcher feels hardly be unfolded earlier. Street children are very commonly found on several railways stations, who use to live only on platforms for their survival and existence. The research interest was mainly on excavating the reasons of migration of such children to different railway platforms and junctions of Kolkata, specially Sealdah and Howrah Railway Station. The objective of the study was to find out the reasons for occurrences of such street children, along with the push and pull factors behind such incidents and to have an idea about the types and extent of sufferings of such children. The ultimate objective of the study was to send them back to their families. The methods adopted were case study, focus group discussion, semi-structured interview, observation etc. Information was collected from 22 street children, 13 parents and 10 neighbours who were directly attached with these categories of children. The study identified that more number of children were Muslims with compare to Hindu; again among the respondents more boys were identified in comparison to girls. Higher age group of children was more in number. Poverty, large family size, marital conflict of parents, family disputes, peer group pressure were the root causes of such migration. Maximum number of respondents came from South 24 Pgs, North 24 Parganas, Howrah and Bihar. In platforms, sexual abuse, physical torture, social isolation and use of abusive words against such children were very common. They hardly had any access to toilet, drinking water, fixed place for spending night. Children suffered from chronic diseases like fever, cough and cold, skin diseases, along with some genital diseases. The platform environment forced the children towards criminal activities, drug abuse, substance abuses etc. Children were mostly engaged in begging, working in hotels, hawkers' stall etc. The proper implementation of JJ Care and Protection Act

along with other ongoing govt. programme like integrated street children programme with the support of NGOs can only be helpful for such children for their rehabilitation and mainstreaming.

WCD-18: **Empowerment of women through participation in local self government: a micro level study**

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This paper is an attempt to explore that how the participation of women's in local government (Panchayati Raj Institution) has led to their empowerment in India and at the same time it has identified the factors that hinder women's participation. The study tried to investigate the socio-economic profile of elected women members of the Panchayat and their perception about their role in PRIs, to identify the causes and obstacles that infringe the participation of women in the Panchayat Raj institutions and to empower the women in future through political and administrative institutions like Panchayati Raj. Birbhum district was purposively selected for the study as Birbhum is one of the five districts where Strengthening Rural Decentralisation Programme had been working since its inception in West Bengal. The study included Birbhum Zilla Parishad, 4 Panchayat Samity and 16 Gram Panchayat. A total of 40 elected women representatives, 10 key informants and 10 government officials were included in the final study. The study found that women belonging to reserved category (SC and ST) had started entering the arena of politics due the reservation. In majority of cases (45%) women member had a political background and 60% of the respondents belonged to middle age group (31-40 yrs). The educated women were more likely to take up their responsibilities from the initial phase, whereas for the illiterate or neo-literate women, the initial phase of inertia did not allow them to undertake their duties and responsibilities well from the very first day. It was also observed that women member became more independent after the 2nd or 3rd term of election. This study will help to understand how political participation of women is empowering them and it has also identified the factors hindering women's political empowerment. The findings from the study suggest that PRI could be used as an important device for the empowering women.

WCD-19: **A Study on the implementation of child rights, its effectiveness and limitation with special reference to the Right to Protection in Diamond Harbour-II Block of South 24 Parganas, West Bengal**

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Child is important in a society for its development and for development of the whole nation. Some social evils faced by the children are abuse, trafficking and child labour. The Constitution of India recognizes that children need to be protected and nurtured for their proper development through Acts - Immoral Traffic Prevention Act 1956, Child Labour Prohibition and Regulation

Act 1986 and Juvenile Justice Care and Protection Act 2000. The researcher was keen to find out whether the children were really protected and how far the implementation of these Acts was taking place. The stakeholders from Kamarpole, Mahisgot, Choto and Bara Busna village, South 24 Pargana, West Bengal were selected with the help of purposive sampling technique. The objective was to know in detail about the Constitutional provisions and other legal supports ensured for child protection and child development, to evaluate the programmes implemented for providing the Right to Protection through the above mentioned Acts as adopted by the GOI. Data were collected from 50 beneficiaries, 11 Govt officials responsible for implementation of the Acts and 14 NGO workers and others. The study reveals that more Hindu girls were school drop outs than boys due to early marriage. The children were victims of different types of abuses. Maximum numbers of interviewed children were members of youth groups therefore were aware of child rights and child protection. BCC and ATC were established by NGO. NCLP School and Child Protection Unit were absent. The Govt has failed to implement these Acts; therefore, whatever protection the children received is due to NGO intervention. The protection of the child in South 24 Pargana was still a dream to the society and it was expected that the child protection can only be possible either through proper implementation of the Acts, programmes and policies by Govt officials and other responsible authorities along with strong NGO intervention where the NGOs will enjoy more liberty and freedom for extending their services by establishing effective co-ordination network and liaison with Govt officials, PRI members, CBO members and maximum participation involvement and decision making power of the community itself. The job opportunities for the poor people should obviously check the sufferings of the children and can protect such vulnerable.

WCD-20: **Effectiveness in the process of implementation of "Protection of Women from Domestic Violence Act, 2005" in South 24 Parganas**

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The Protection of Women from Domestic Violence Act (PWDVA), 2005 is an Act to provide more effective protection of the rights of women guaranteed under the Constitution who are victims of violence occurring within the family. PWDVA, 2005 was brought into force on 26th October 2006. The question, however, is 'how much the people are aware about this Act?' Hence it is required to enhance the awareness level of the people about this Act. The present study was conducted to develop an idea about the implementation strategy of the PWDVA; to know about the process of implementation of the Act; to understand the effectiveness of the Act; to know about the challenges faced against the implementation of this Act; and to make the Act more meaningful and gainful for the women. The study was conducted in two purposively selected villages of Baruipur Block of South 24 Parganas District. Data collected through personal interview with semi-structured interview schedule and case study from purposively selected 50 respondents found that 'Protection of Women from Domestic Violence Act' was launched at West Bengal since 2005 but hardly the beneficiaries get the benefits of the Act in an effective manner. The study identified that except the Protection Officer and D.S.W.O. most of the stakeholders were not

effectively attached with the implementation of the Act and many of them did not yet have definite knowledge and information about the Act.

WCD-21: **The socio-economic status of tribal development: a case study of KodalBasti forest village, Jalpaiguri**

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A large share of tribal population in the KodalBasti Forest Village, Jalpaiguri district belongs to Rabha and Santhals. These tribal populations, nowadays, settled in the remote areas of the forest regions and living in complete isolation from the main civic society. Though they are living in the multi-ethnic society, they are trying to retain their traditional values, systems and cultural identity and lagging far behind the actual development processes. In pre-British period, they were nomadic in nature and earned their livelihood through shifting cultivation, fishing and hunting and maintained symbiotic relation with nature. After the annexation of Dooars by the Britishers, these forest regions were recorded as reserved forest and the tribal people were displaced and their rights to the nature were restricted by law. After independence the scene did not change remarkably. Till now, they are facing the problem associated with property right, ownership of natural resource, infrastructural development and the unavailability of financial grants. A detailed questionnaire survey in this region reveals their actual socio-economic status, their deprivation in regards to health, education, inequality, poverty, migration, gender deprivation which segregates them from the mainstream of the society. These long standing economic problems finally change the earlier concept of symbiotic relation with nature. Despite of the efforts, illegal felling, Deforestation have became common phenomena of this region. This present paper highlights the issues related with the socio-economic status of the tribal community of the region and their relation with the nature.

WCD-22: **Sufferings of the trafficked girls before their rescue: a study on selected girls from India, Bangladesh and Nepal**

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Trafficking of women and children has become a transnational crime and is incompatible with the worth and dignity of human beings. This study was done having the objectives to find out some possible reasons behind trafficking of women and children and to know the major sufferings of trafficked girls during the process of trafficking. At "Sanlaap" home, a rehabilitation centre for trafficked victims, at Narendrapur, Kolkata the study was done. As West Bengal is a transit state, cross border trafficking is a common phenomenon here. The present investigator purposively selected 40 girls among which 14 were Nepalese, 13 were Bangladeshi, 13 were Indian. Mainly based on case study, observation, PRA, FGD method, the researcher came to know the physical, psychological, and social sufferings of the girls. Very interestingly it was found that most of the

girls were trafficked at early adolescence period (12-16 yeas) by their relatives and neighbours. Though poverty was the prime cause of trafficking, other reasons like unemployment, early marriage, forced marriage etc were the push factors, and some pull factors were there. The girls were brutally tortured and several abusive words were used against them without considering age, mental strength, and physical abilities. They were forced to accept the profession like prostitution. The psycho-social status of such girls was inexplicable. Though all of the respondents were rescued and presently at 'Sanlaap', they were still traumatized by their past memories. Again they were afraid of the system of re-patriation and re-integration process which is still a barrier for their social acceptance. Mainstreaming of such girls was a big challenge for Govt. and NGOs.

WCD-23: **Gender-sensitive poverty analysis through local perception at Habra-II Block of North 24 Parganas District, West Bengal**

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Appraisal of poverty has been an important area of study for targeting, prioritizing and planning poverty reduction measures and their monitoring and evaluation. Apart from household survey, participatory methods have recently been employed for getting rich insight of poverty. However, quantification and scaling up of such appraisal has remained largely elusive. Recent researches suggest that incorporation of local perception is able to define poverty, can assign poverty line and summarise poverty statistics. But, explicit consideration of gender perception in such participatory poverty analysis has not been done. The present study was conducted in eight villages of Habra-II Block of North 24 Parganas District, West Bengal selected through maximum diversity sampling. The study used participatory well-being ranking exercise with men and women to incorporate local people's perception in defining their poverty. From peoples' statement scoring a wealth index for households was calculated. Poverty line was identified by qualitative judgment of statement scores and summary poverty statistics were worked out. The perception of men and women differed in many aspects of poverty and the poverty line assigned on the basis of women's perception was found to be different from men's. This resulted in higher percentage of households below the poverty line than that of the result worked out from men's perception. When considering the view of both men and women, the poverty line was fixed in between their individual poverty lines. The method can be used for targeting development programmes with an explicit gender concern.

WCD-24: **Tribal women and self-help groups: a critical study**

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Self-Help Groups is considered as one important means for bringing women to the forefront of the society. It is also argued that micro-finance can empower women since it instills a perception of strength and confidence through augmentation of incomes and their participation in group activities. The process of collectives or being a member of collectives facilitates the process of

empowerment. It is in this context that in the tribal areas of Manipur also, many self-help groups were formed in the 90s. Like the other areas of rural India, this part of the country is also characterized by conditions of poverty, malnutrition, ill-health, insanitary conditions, illiteracy etc. As such, at the start of this movement there was much expectation on its potential as an instrument for women's economic upliftment. After two decades into this movement, what becomes of Self-Help Groups is attempted to study here. What is the impact it has on its women member? Does it uplift their position in the tribal society or is it something which is not suitable for their society? What are the factors that contribute to the success or failure in this regard? This study therefore attempts to find out the impact of Self-Help Groups on tribal Women and the factors contributing for the success or failure of Self-Help Group in the tribal inhabited areas of Churachandpur District.

WCD-25: **Trends of criminal offences among the children left villages, living in streets**

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Child delinquency has been a sphere of academic and practical interest for pragmatic reasons. However, empirical enquiry is not common in academic circle as far as West Bengal experience is concerned. The present study was conducted to identify the types of criminal activities among the street children who left their villages, to identify the factors which compelled them into such activities and to identify their sufferings. To fulfill these objectives research methods such as case study, focus group discussion was adopted. After analysis of data it was found that: the children belonging from the age group of less than 6 years was lesser than the higher age groups and the maximum number of girls belonged to the age group of 10-14 years. It has been found out that the reasons behind leaving their home was poverty, search of food, earning of money, and peer pressure. The main activities of the children were sweeping the train compartments, platforms and bottle picking from the railway tracks. Forced to alcohol, assaulted with weapon, forced to drug, and other factors such as forced to injection and tablets and separation of organs were more as compared to girls because girls were sexually assaulted rather than boys. The unavailability of food, clothes, and insecurity was persisting commonly in case of both the genders. Both boys and of girls belonging to the age group of 6-12 years and also who belong to the age above 13 years were involved in substance abuse especially dendrite. Thievery was another criminal activity committed by the children especially boys and stealing of wallets and mobile phones was maximum among the age group of 6-12 years. Majority of the children earned more than Rs. 200/day either by working or stealing, where they spent half of their money in drug addiction. From these above data this can be implied that until the society develops a positive attitude towards such uncared and unprotected categories of children, it is very difficult to protect such children and go for any sort of development.

WCD-26: **Dimensions of gender inequality: a village level analysis**

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The relative status of women is poor in the developing world, compared to developed countries. Gender inequality is present in all spheres, especially in education, health and civil freedom. The basic dimensions of gender inequality are economic dependency of women on the male counter-parts, lack of basic facilities, lack of educational facilities, poor decision making power of the women and poor levels of public participation. These form a vicious cycle, where they are the reasons as well as the outcomes of the problem of 'gender inequality'. Allowing gender difference in education and health are not an efficient economic choice. Societies that under invest in women pay a price for it in terms of slower growth, lower income and unhealthy social environment within the society.

INSTITUTIONAL ISSUES IN RURAL DEVELOPMENT

IIRD-01: **Divyayan Krishi Vigyan Kendra: an impact study**

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Divyayan KVK with its concept of total approach for all-round development of farming community has been conducting training programmes to effect transfer of need and skill oriented technology to the farmers in a holistic manner. The programmes are conducted in both the forms-On-campus and Off-campus. All the On-campus programmes are residential and include motivational training of six weeks and special training of long duration for developing adequate proficiency level for learning and practicing the skills. In motivational programmes, basic knowledge on agriculture and allied disciplines with special reference to its economic viability and potentiality is given while in the special programmes area specialization to achieve greater proficiency is attempted. Off-campus programmes of short duration for the villages are also organized at the farmers' fields. The method of imparting training is mostly '*learning by doing*'. To invigorate the ex-trainees for rendering service to their fellowmen, the Divyayan KVK has been providing necessary help and guidance to them to get themselves organized as Self Help Groups (SHGs) and farmers' science clubs (known as Vivekananda Seva Sangha) to function as the extension centre of Divyayan KVK and serve as a catalytic agents in village development. Divyayan programmes attach a special importance to economic well being of the down-trodden dovetailed with the improvement in the general quality of life in line with the teachings of Swami

Vivekananda. The study revealed that there has been a substantial change in food security, status of self-employment and level of migration through intervention of the KVK. On the agricultural side, the productivity of crops and animal resources has increased significantly. The SHG has been successful in empowering women and the "Farmers' Science Club" is disseminating the improved crop management practices satisfactorily.

IIRD-02: **Development of agricultural farmers through cooperative banks – with special reference to Mysore district**

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In the wake of introduction of economic reforms in India since 1991 with emphasis on globalization and liberalization, financial sector reforms have assumed considerable importance. The basic objective of reforms in the financial sector has been to improve the efficiency, competitiveness, transparency and productivity of financial system as a whole. Under the process of financial sector reforms, Government of India gave considerable financial help to Public Sector Banks as also RRBs. However, cooperative banking sector have been denied this pattern of financial assistance despite the fact that the cooperative banks were engaged in the vital task of transforming rural economy of the country. It is known that cooperative credit sector including agriculture and rural development banks constitutes an important segment of Cooperative Movement and is playing a critical role in financing short-term, medium-term and long-term agriculture operations including investment oriented projects for promoting rural development. Keeping in view the importance of cooperative credit sector in the context of socio-economic development of the rural areas, the common minimum programme of the present Government has emphasized on the need to nurse back the weak cooperative credit sector to health and it has been proposed to double the flow of rural credit in the next three years so as to ensure that the coverage of small and marginal farmers by institutional lending is expanded substantially. In view of this, it is imperative that greater emphasis needs to be laid in the coming years on scientific appraisal of loan applications and on the follow-up of utilization of loans sanctioned for specified objectives. In this context, it is pertinent to conduct in-depth study on the role of cooperative banks in the empowerment of farmers.

IIRD-03: **Role of microfinance through RMK in empowering women**

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The article deals with the development of child and women and the emergence of RMK as a microfinance system in our country. It has been widely accepted that there is a close correlation

between human development and the empowerment of women which constitute 48.2% of the total population of the country i.e. nearly about 496 million as per 2001 census.The human development among women can be done through skill up-gradation, behavioral training and personality development which needs economic and social support. Availability of finance and technology is considered as the key to achieve this growth. Various SHGs play an active role in bringing the rural as well as urban women to become self-sufficient by generating income for themselves. The banking and other institutions are extending helping hands to these SHGs and financing for marketing their products. Women always proved to be good manager whether it is at home, be at industry, trade etc. There is an urgent need to address the problems faced by the women and child development sector in our country and the planned programmes formulated by the governments to tackle the problem. These problems can be solved by creating a single window and abolish the red tape system by the government. Microfinance is proved to be a major tool for empowering women and child development.The success of microfinance through SHG has encouraged government of India to established national level micro credit organization i.e. RMK under Ministry of Women and Child Development in 1993.The article discusses objectives,credit delivery mechanism, various loan schemes, activities undertaken by RMK and its capacity building with other support services for the sustainable growth for women as well as the country.The article will be used as a desk research for the further study and it will be used as a information generator of the micro financing system for women development.

IIRD-04: **A case study on social development of Lodhas of Jhargram**

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The Lodha are a traditionally nomadic community, who now lead a primarily settled life in the border area of Jharkhand and Orissa**.** They are also Primitive Tribal Group. This paper tends to examine the Lodha in terms of their physical environment, society, economy, culture, polity, and the connection between tribal livelihood and ecological degradation. They are engaged in seasonal collection of minor forest products, catching of fish or tortoise, supplying firewood, silk cotton, collection of honey, snakes and supplying these to the outsiders. They have a good association with plant resources they use for their existence. They turned to the forests for their livelihood by cutting wood and collecting other forest produces. Their women took up collection of forest produce and latter, agricultural wage labor on the farms of neighboring peasants out of sheer economic necessity. The social costs of such intermittent nomadism were - high infant mortality, physical decline of women resulting in low life expectancy, denial of all schooling training and healthcare opportunity to the children who went with their mothers, increasing incidence of alcoholism and domestic violence, frequent destruction of family life and stability. The paper will briefly discuss the application of Government policies among the Lodhas. Education, occupation, health, housing, sanitation, and social protection schemes are the main points which will be discussed briefly. Development means to increase the ability and widen the distribution of basic life sustaining goods, raise the level of living, and expand the range of economic and social choice to individual and nation.

IIRD-05: *Esprit De Corps*: A study on the Mulukanoor Women's Mutually Aided Milk Producers' Cooperative Union

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Rural cooperatives are closely attached to agriculture and agro-based activities like dairy, poultry etc. and cooperatives affected the farming community in terms of their income levels, and quality of life. CDF (Cooperative Development Foundation), which has been promoting the thrift cooperatives in Andhra Pradesh, started promoting women's thrift cooperatives especially in Warangal and Karimnagar districts. When these thrift savings reached peak at this moment CDF with the support of Mulkanoor cooperative Rural Bank and Marketing Society Limited together ideated to start a new dairy in Mulukanoor area of Karimanagar, which could provide an alternative livelihood and supplementary income to the families in this area. A survey was conducted in this area which has shown that there was a market demand for the milk in the nearby towns and surplus in the villages. This cooperative dairy was intentionally made for women as they were cautious and made productive use of money, and it was observed that in 80% of the cases women take care of cattle and handle milk producing activities. The journey of this women's dairy started on 17th August 2002. The members were trained in terms of technical knowledge, leadership and management of dairy. When they dairy started from first year itself it started earning profits. This women's cooperative dairy brought new dawn into the lives of rural women by making them strong socially and economically. This dairy is being maintained by women and 90% of the administration staff and other employees are women only. The administration and governance made this dairy unique among others. The milk procurement, processing, and selling are done in such a way that the cost of production is less and the members are paid high in compare to other dairies. Though this cooperative is not free from problems faced by other cooperative, the women members are resolving the problems and proving themselves in the men dominated world and changing the fate of villages of this area.

IIRD-06: Tribal administration and rural development in Meghalaya: the case of traditional institutions in Khasi Hills

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In many countries of the world it has been widely acknowledged that development of rural people and weaker sections is the quintessential prerequisite for bringing in effective all-round development in rural areas. Like other parts of India, the Northeast region too experienced the introduction of various rural development programmes in different periods. However, compared to the rest of India, the rural development scenario in Northeast region is distinctive and complex. This is so because Northeast region display certain typical features that are not found in the rest of India. Meghalaya is one of the states of Northeast India where majority of the people live in rural areas and most of them are tribal. Tribal people have been seen to be strongly associated with the forests, hills and remote areas, practicing a unique life style, having a unique

set of cultural and religious beliefs. Unlike the rest of India where rural development activities are performed by Panchayati Raj system, in Meghalaya there are traditional institutions of self government which are supposed to carry out village development works through the Village Councils (Dorbar). However, from the point of modern-bureaucratic administration, these traditional institutions fall under the Autonomous District Councils (ADCs) and the ADCs are again fall under the State Government. These traditional institutions are responsible for the maintenance of law and order in rural areas, organizing the annual festival, settling intra-village boundary disputes, interacting with government departments, implementing government schemes and organizing the annual council meetings. In the Khasi Hills of Meghalaya there are four types of traditional institutions namely; Syiemship, Lyngdohship, Sirdarship and Wahadadarship. In this paper endeavor has been made to decisively analyze the pattern of tribal administration in the Khasi Hills of Meghalaya and to examine the role of these traditional institutions in rural developmental activities.

IIRD-07: **Role of Solapur Gramin Bank in the rural development of Solapur District, Maharashtra**

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The objective of the present research paper is, to overview the role played by Solapur Regional Rural Banks (RRBs) in the rural development of Solapur district in Maharashtra. The regional rural banks (RRBs) is playing very important role in the agricultural and rural development of the Solapur district is the basic hypothesis of the present research paper. In the context of liberalization, privatization and globalization of economy, the role of the RRBs in the rural development is very important. These banks have an important role to play in the process of the rural development in this country. These banks are localized institutions, this is their main strength. They know the area quite closely. They have intimate knowledge about the people and problems in economic resources i.e. agricultural land and cotton textile and sugar industry. The district is famous for its 'Jowar' crop throughout Maharashtra. Solapur Gramin Bank Ltd. Solapur was established on 21st January 1984, under the provisions of Section 3(1) of Regional Rural Banks Act 1976. The area of operation of bank is in Solapur district. The bank's objective was to help and develop rural economy by providing credit and other facilities to agriculture, trade, industry and other productive activities. In the current economic scenario, the functioning of RRB has experienced a far-reaching change with the introduction of banking sector reforms and application of prudential norms as part of financial sector reforms. This research paper is completely depended upon secondary data i.e. Annual Reports of the Solapur Gramin Bank for ten years. The annual reports are collected for 10 years from SGB Head Office at Solapur, collection of primary data is unable during short period of one month. For analysis and interpretation of data, the researcher has used the tabulation, classification, simple average, growth rate and percentage technique etc. The period of the study is only 10 years from 2001-02 to 2009-10. The SGB has 33 branches in Solapur district of Maharashtra state comprising 11 blocks covering 211 villages. The paid-up share capital of the bank is Rs. 10000 thousands which is contributed by Govt. of India, Govt. of Maharashtra and Bank of India i.e. sponsor bank in the

ratio of 50%, 15% and 35% respectively. During the study period of ten years, the total deposits were increased by Rs. 473680 thousands. In selected period, total deposits were increased by 92.00 percent. The total borrowings outstanding were decreased by Rs. 4689 thousands. In ten years study period growth in amount of loans and advances were 51.49 percent. The average C.D. ratio is 80.65 percent in selected study period. The increasing trend in C.D. ratio is very important for profitability of the SGB. As per the opinion of researcher, increase in loaning amount of SC/ST, SF/MF/AL and minorities is very essential for real social justice and national integration. During study period NPA provision was increased by Rs. 7200 thousands. NPA accounts is vigorously being taken up by way of personal contacts with borrowers, sending reminders, organizing recovery camps and compromise settlements, recovery through group approach etc. The SGB has taken various steps for reduction of NPA, such as formation of task force at head office, recovery camps/compromise camps at regular period, appointment of link officers etc. The personal accident insurance scheme for KCC holders is implemented in SGB. There are 3050 SHGS functioning in SGB. In SGB, 39 farmers clubs formed under farmers club program of NABARD with a view to provide prompt and better customer service, all 34 branches are computerized. As per the opinion of researcher, the working performance of the SGB is at satisfactory level.

IIRD-08: **Agriculture based livelihood enhancement through producer company approach: NAIP- Sustainable Rural Livelihood Security in South Rajasthan**

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Attaining Livelihood and Nutritional security, improved quality of life and sustainability of agriculture has always been an important goal to have social equity and inclusive growth. Despite efforts by central and state governments, the productivity and profitability of the tribal regions of the country has not improved. In Rajasthan, 4 districts has been identified by the planning commission as disadvantaged districts. To address these livelihood issues of farmers in tribal dominated south Rajasthan, Access Development Services (ADS) has been working in two districts of South Rajasthan under National Agriculture Innovation Project (NAIP), under a program entitled Livelihood and Nutritional Security of Tribal Dominated Areas through Integrated Farming System and Technology Models along with ADS is working with a consortium led by Maharana Pratap University of Agriculture and Technology (MPUAT) and including Krishi Vigyan Kendra (KVK). With the need of improvement in the infrastructure base pertaining to inputs, new technology, processing units, storage and market, ADS is working with the producer groups and aggregate them for increase in their socio-economic status. ACCESS is working on a producer company approach where the producer Company is a market-oriented, community-based organization. The Company would bring together small producers in the project areas to own and manage a formal structure that would help them integrate and participate in the mainstream value chain. The producer company model will demonstrate the ability of a primary producer to overcome local social and market impediments to sustainable and growth oriented livelihoods with enhanced productivity. To achieve this, ACCESS first formed producer groups

named FBGs under self-help principle and federated them into producer marketing company. The group leaders have been sensitized on the legal and operational issues, taken on exposure visits and the producer company subsequently registered, the governing structure has been established and the management responsibility has been assigned to qualified members. Of the four Producer Companies, JKAPCL is the one with about 800 farmer shareholders and a turnover of 14 lakhs. JKAPCL has currently engaged itself in collective input supply and aggregation and collective marketing of its farmers produce. Though the model is to address several challenges, this would prove to be the best model to get a control over the means of production and increase the productivity through quality inputs, adoption of technologies and access to financial service.

IIRD-09: **Panchayati Raj Institution**

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Panchayati Raj Institution is the back bone of rural development. Rajasthan was the first state to implement Panchayati Raj system and Kerala is the forerunner of Decentralization and people planning in India. Present U.P.A government had implemented welfare as well as right based programme like BHARAT NIRMAN YOGANA, MGNREGS etc. central government and some state government also awarded as NIRAL GRAM due to their development in all aspects. The Three tier Panchayati Raj system is expected to provide a non-bureaucratic Institutional support to rural development programme. Although the Panchayati Raj Institutions have existed for many years, owing to inherent weaknesses in the system they were not very effective in the implementation of rural development programme. In Panchayati raj system some state performing very well like Kerala and some are poor like Utter Pradesh. So this preliminary study addresses the differences between the "The Institutional structure of Panchayati raj system in Eastern Uttar Pradesh and Marathwadha region of Maharashtra and the Implementation of Rural Development programme." The study will suggest insights in the proper functioning and implementation of the New Decentralized system in the above two region of different states of India.

IIRD-10: **Self-Help Groups and political empowerment of women in panchayat raj institutions: filed reflections from Andhra Pradesh**

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Women empowerment has been of the major concern for the policy makers since independence. The 73rd and 74th amendments acts have somehow tried to fix the whole discourse. But the expected rate of empowerment has not been so far achieved. It has gained a mixer of opinions from the intellectuals, some of them argue that the 33% reservation for women in Panchayat Raj is a major breakthrough for their political empowerment and has opened the doors for women to exercise their political rights at the grassroots level and some more argue that most of the women

who are elected to the Panchayats are not capable of fulfilling their responsibilities, which are assigned to them. Adding to that Self-Help Groups (SHGs) have become a vehicle of development to empower rural poor women and enhance their self-reliance. In recent years, particularly in Andhra Pradesh these groups are acting as not only the mechanism for the empowerment in socio-economic realm (health, nutrition, education and financial assistance through micro-credits), but also as an institution that can serve as a recruitment pool and training ground to strengthen women's participation in the political sphere. These groups have added value to the whole discourse of women empowerment. SHGs facilitate women political participation and enhance their active engagement in local politics, it has certainly helped the women panchyat leaders to eliminate their proxy role in the Gram Panchayat. In this context the paper look at the possibilities on augmenting women's political empowerment through the advent of the SHGs in rural areas. It examines how the SHGs have maintained potential synergies between SHG membership and women's political participation at the grass-roots level.

IIRD-11: **Decentralized planning: experience of West Bengal Panchayats**

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The term 'decentralization' has generally been used to refer to a variety of institutional reforms. It has sometimes been considered as a change in the organisational framework in which political, social and economic decisions are made implemented. The term decentralization has also been understood as a mechanism to transfer responsibility and authority. In recent years, decentralization has received singular attention all over the world. It has been considered as one of the most important elements in development strategy. It is a global and regional phenomenon, and most countries have attempted to implement it as a tool for development, as a political philosophy, and as a mechanism for sharing responsibility at different levels. Since 1980s, developing countries have increasingly adopted decentralized form of governance. Decentralization means the transfer of authority and responsibility from central to intermediate and local governments. Although the democratic decentralization in terms of Panchayati Raj Institutions was a post-independence phenomenon, there has been a legacy and tradition of village panchayats since time immemorial in India. The 73rd Amendment Act has made Panchayats an institution of self-government. As per the constitution, Panchayats shall prepare plan for economic development and social justice at their level. The District Planning Committee shall integrate the plan so prepared with the plans prepared by the local bodies at district level. The success and failure of the Panchayats would depend on planning and implementation. It also depends on maximum people's participation at every stage of planning process, from proposal to implementation. People's participation in local level development has been exercised through the formulation of the panchayat level development plan, project coordination at intermediate and district levels of the panchayats. The Panchayati Raj Institutions (PRIs) in West Bengal are very strong bodies, which function as real institutions of self-governance. In West Bengal, the planning process of grass root level has some stages from proposal to implementation. In the present study, attempts have been made to discuss the methodology of decentralized district planning and its status of West Bengal. This paper also examines the real issues involved

in the decentralized planning of West Bengal. District Birbhum of West Bengal has been considered for this study. This district is one of the backward districts of West-Bengal. For the present research work field investigation has been carried out in Ruppur Gram Panchayat of Bolpur-Sriniketan Block and Rajnagar Gram Panchayat of Rajnagar Block, Birbhum, West Bengal. Successful planning and implementation of development programmes require adequate funds, appropriate policy framework and effective delivery mechanism. After 73rd and 74th Amendment, the Government is trying to change in planning and implementation process by adopting bottom up approach. It is found from the study that due to financial limitation, low people's participation, local political influence in administration hinders the way of success. Presently, decentralization is a bottom up approach but till now the implementation process is top down. So, most of the time the plans prepared by the villagers are not implemented properly at grass root level.

IIRD-12: **The grass without roots: Status of Panchayats in rural development in vibrant a democratic state - A case study of Gujarat**

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This paper tries to examine the meaning and level of devolution of power among Panchayats in the context of Rural Development to make the grass roots democracy more vibrant and dynamic. The post 73rd amendment scenario is giving us a complex picture regarding the devolution of powers to the grass root level. To find out the gap between theory and practice, in other words legislation and follow up action, this paper tries to find out the existing status and modalities for proper implementation. As it is found that some states like Kerela, West Bengal, Karnataka are pioneer in terms of not only legislation but also implementation. But some other states like Assam and Punjab have also made considerable amount of progress. Gujarat is known as the birth place of Mahatma Gandhi, who strongly supported Gram Swaraj. As a matter of fact Panchayts plays a great role in the field of rural development. At the same time Gujarat has done tremendous amount of progress in the field of rural development. In this context this paper tries to examine status of Panchayats in Gujarat

IIRD-13: **Strengthening of Panchayati Raj Institution in West Bengal through participatory programme and management of natural resources**

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PRI is a political as well as peoples' institutional instrument adopted in India after 73rd amendment Act 1992 with a vision of democratic decentralization and peoples' participation in their own developmental process. The present study wanted to study the process of strengthening of PRI in West Bengal and to develop an idea of the participatory programmes through various

activities and the way people manage their natural resources. The study further wanted to examine the effectiveness of the decentralization process and to find out some limitations behind the effective implementation of the process. The basic issues examined were - in context of the peoples' participation how far PRI was an effective instrument, how far decentralization of power was operative in PRI, to what extent women empowerment took place through their participation in PRI function, how far the natural resources were being utilized in a disciplined manner by the beneficiaries in PRI. Purulia and South Dinajpur districts were selected for conducting such study as WBSRDA started their 'strengthening Rural Decentralization Programme in these Districts from 2005. SRDA identified 7 blocks of South Dinajpur and 20 blocks of Purulia for strengthening Rural Decentralization where from 4 blocks from each district was selected for the study. Information generated through key informant interview, semi-structured interview schedule, Participatory Rural Appraisal (PRA) found that due to the poor knowledge of rural people they were unable to circulate knowledge among the grass root people and were also incapable of maintaining 'Public Relation Management System'. Even the elected members were not properly aware of their roles and responsibility of the gram panchayat. Gram Unnayan Samiti members were not properly sensitised about their duty which directly affected the planning process from Gram Sansad level and ended up to erroneous allocation and distribution of funds. Elected women members were mostly coming from politically empowered families which hinders the democratic environment and a large no of them were not aware about their duties. Most of the farmers used chemical pesticides and fertilizers that reduced the fertility of their soil as well as makes the product unsafe. The role of Panchayats, ADO and KPS were non-encouraging in this regard. Only plantation programmes had been done as the utilization of wasteland in selected G.P. Lack of technical knowledge made them incapable for alternate livelihood activities.

IIRD-14: **A study on the impact of women's participation in rural local governance for empowering the women of West Midnapore, West Bengal**

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With the passage of 73rd Amendment Act, 1992, India is at a crucial structure in the evaluation of Panchayati Raj Institution (PRIs), the Indian brand of rural local self government. It has envisioned people's participation in the planning process, decision making, implementation and delivery system. The devolution of powers to the Panchayati Raj Institution (PRIs) is one of the important issue on which the debate is going on for the last few years in the country without arriving at any conclusion, even after the enactment of the 73rd Amendment to the Constitution of India. Because, this amendment provides space for weaker section of the society like SC, ST and women. The present study is an effort to know the impact of political participation in local rural governance for empowering women in West Midnapore district with a major objective of the implication of 1/3rd reservation of the society and individually as a whole. The methods used for collecting data were interview, FGD etc. The findings of the study has revealed that the emergence of politically elected women representatives but sometimes majority of them are not treated with due respect. It is also true that though women are not in proper decision making

process but after entering the PRI system they gain the socio-economic status and getting priority from others. If we see last few years back, we can find that the rural women hardly get chance or show any interest for their own rights and development. 73rd Amendment acts as an instrument for empowering women partially, not fully due to some social obligations like male domination, illiteracy, shyness, mounting pressure from family, lack of political will of political parties etc. But if the women get chance to show their efficiency with imparting the proper education, vocational training, they can do better even than man with full dedication, transparency and sense of responsibility.

IIRD-15: **Role of NGO in the rehabilitation of orphan and destitute children: a case study at Bhagirathi Shilpasram in Nadia district**

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An attempt has been made in this paper to analyze the role of NGO in the rehabilitation of orphan and destitute children of our society. This paper also analyses the government policies regarding the inmates of study area. This paper deals with the socio-economic profile of the family of inmate of study area. Rehabilitation of the orphan and destitute who come out from the down-trodden section of human society is the major problem in our society. But the rehabilitation of the victimized girls who come out from different red-light areas is the vital problem of the society. Nadia district has a vital role to play in solving the rehabilitation problem with the help of various orphan homes. Bhagirathi Shilpasram is a home. It serves the hospitality service particularly for the development of orphan and destitute girls like education, medical, recreation and rehabilitation facilities with its NGO animation as Cottage, Mass education, and MWCD scheme affiliated by the State and Central Government. Collected data have been tabulated and made the figure (Ternary Diagram) by simple cartographic and statistical techniques. This field surveys shows that 68 % quota safeguard for female and 32 % male inmate in Nadia district and also 50 % and 10 % safeguard for Cottage and MWCD scheme in B.S. Ashram respectively. Maximum inmate of B.S. Ashram gathered from Nadia (30%) and Kolkata (27%) district, especially from poor economical society of rural area. This altruistic asram has not overcome the various problems i.e. scheme-wise sanctioning quota gradually decreases; residential building is very old, insufficient of cultivation in the ashram farm, lake of health consciousness of the ashramic girls etc. In spite so many problems the ashramic girls joined different jobs like Anganwadi worker, nursing etc. when they come of age. Finally, suggestion has been made towards the financial support from government and other respective source for quite sustainable development of inmates of B.S. Asram and also the socio economic development of the overall society.

IIRD-16: **Corporate Social Responsibility and rural development in India**

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Businesses are meant for earning profit but since it operates in the society, something more is

expected out of it. In a broader term the responsibilities that business has towards society is termed as Corporate Social Responsibility. The paper examines some issues related to corporate social responsibility initiatives by corporate giants in India. The paper is divided into various sub-heads making a review of the CSR activities by foreign companies, Indian MNCs and PSUs. The paper is an attempt to identify the underlying objectives for performing social welfare activities in rural India. We have tried to identify these objectives by means of various examples.

IIRD-17: **Corporate participation in rural development: an exploratory study**

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The purpose of the paper is to investigate the Corporate Social Responsibility (CSR) activities with respect to integrated rural development of premier private and public sector Indian companies which in turn imply to find out the importance attached with such programmes in terms of budgetary allocation as percentage of the total allocation of CSR. The Paper also tries to delineate the current government policy and corporate position in this regard, it analyses and critically evaluates the same and suggest steps to be taken for greater and better incorporation of the same. The research design mainly connotes a stratified non-probability judgement sampling in which the companies are initially classified into public sector and private sector within which stratification is done on the basis of ranking and 'ratna' status. The findings involve the fact that though the top ranked companies do invest a sizeable chunk of their profit into CSR activities, the share of integrated rural development activities in that is still not very substantial, the factors like inclusive growth, decoupling, urbanization, emerging market concept, new protectionist measures in the economically developed countries etc. are prompting companies to think of rural development measures as part of business model and not necessarily from philanthropic angle. The main limitation is that the sample chosen is small and may not be fully representative of the population to draw a general conclusion, but the indications strongly point to the findings. Primary implication of the paper is that corporates having extremely capable people, technology and geographical reach and at times more powerful than governments and countries are important catalyst in the speedy rural development—there is a growing realization that they must play a much active role in the rural upliftment.

IIRD-18: **Kautilya's views on Corporate Social Responsibility**

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In this paper, an attempt has been made to explore the philosophy of Corporate Social Responsibility (CSR) from an ancient Indian perspective. A review of literature in CSR shows that there are thousands of articles which have been written by several academics on this subject from numerous perspectives, but limited articles written about CSR from the philosophical, historical

and from the ancient perspectives. As a result, this article not only fills the gap in the literature, but also provides insights on CSR philosophy from the ancient Indian perspective. In the Indian context, the origin of CSRcan be traced from the *Vedic* literatures such as the *Valmiki Ramayana*, the *Mahabharata* (includes the *Bhagavad-Gita*) and the *Puranas*. These literatures were written more than 5,000 years ago in Sanskrit language. However, in this paper the authors will explore CSR philosophy from Kautilya's *Arthasastra*, which was also written in Sanskrit in the 4th century BC (Balakrishnan Muniapan and Mohandas 408 *Int. J. Indian Culture and Business Management, Vol. 1, No. 4, 2008)*. This paper is based on hermeneutics, a qualitative research methodology which involves study, understanding and interpretation of ancient or classical text. By using the above Methodology, the authors reveal some ancient lessons on CSR, which can provide guidance to corporate leaders today. In a nutshell, the Kautilya's *Arthasastra* provides an inside-out approach to CSR, which is development of the individual leader's self conscience, contrary to the western approach that takes an outside-in perspective. The leaders and the role they play in corporations are crucial in ensuring transparency, good conduct and governance towards the ultimate aim of achieving CSR.

IIRD-19: **Corporate sector: contribution to rural development**

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Corporate social responsibility (CSR) is considered to be an obligation for a firm to pursue long term goals beneficial for the society. It can be visualized as the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as that of the local community and society at large. India resides in Villages. According to 2001 census nearly 73% people are habitants of rural areas. They have the right to have the same standard and quality of life as is enjoyed by people living in urban areas. This can only turn into reality if we think about sustainable rural development. Corporate Social Responsibility is thus considered very important as far as rural areas are concerned. To improve the existing situation, team effort is the demand of time. Only NGOs cannot bring a drastic change in the society. Corporate Sectors with a far better infrastructure and funds can help in enhancing the social functioning because social and economic development in Indian villages will indicate a better and developed nation. This paper will highlight the concept of Social Integration Programme launched under the banner of Damodar Valley Corporation by Government of India in the year 1981 and its role in rural development.

IIRD-20: **Corporate Social Responsibilities – one of the best management approach to bridge the gap between the rural and urban India.**

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India lives in its villages and the base of the Indian economy lies in the development of rural sector, which cannot be denied or underestimated. It is completely agriculture based and it is of

tremendous importance because it has vital demand and supply links with other Indian industrial sectors. Today the rural economy and its subsequent productivity growth are predicted to a large extent upon the development of 65% to 70% of population of India i.e. the rural India. Since the Indian rural economy is worth 40% of total Indian retail market (ASSOCHAM report), all the multinational companies have attempted to elevate their network and market. But there lies a wide gap between various statistical representations and the reality. There are large numbers of people still is without the basic minimum requirements and there are villages without any infrastructural facilities. It reflects the failure and inadequacy of government which has even accepted. Hence there is the need for Corporate Sectors to contribute towards the upliftment of the major Indian inhabitants, Indian rural areas to make Indian economy stronger as they have to depend on them for raw materials of their industries in any form. Corporate Responsibility is the commitment of the business to contribute to sustainable economic development to improve the overall improvement of the quality of life for the business and society at large. Rural India is the supplier of the raw materials for the most of the Indian industry but it is that sector of Indian economy which is at the lowest level. The organisations who are engaged in the business of multi crore of rupees act as a connector and earn huge amount of profit. So from the societal point of view the organisations have the obligation towards the promotion of the development of the rural areas considering the government's regulations and achievement of their objectives. It is the Corporate Sectors only, who can bridge the gap between the rural and urban India in the field of infrastructural development with their updated managerial knowledge and skill under the banner of Corporate Social Responsibilities.

IIRD-21: **Management of natural resources: role for B-Schools - A case study of JDC Bytco IMSR, Nashik**

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Introduction: Human race is blessed with three basic natural resources viz soil, water and vegetation. Over exploitation of natural resources by growing population resulted in severe problems. Under the label of 'development' human beings have destroyed the ecosystem and hence facing lot of environmental problems.

Meaning: Natural Resources Management specifically focuses on a scientific and technical understanding of resources and ecology and the life supporting capacity of these resources. The Management of Natural Resources is on the frontline of the struggle for more sustainable and equitable development.

Economic Growth and Natural Resources: Will the world be able to sustain economic growth indefinitely without running into resources constraints or damaging the environment beyond repair? What is the relationship between a steady increase in incomes and environment quality?

Need for Management of Natural Resources: As on October 27th, 2009 the Earth's population is estimated by the United States Census Bureau to be 6.79 billion. Growing population, falling

energy sources and food shortages will create 'perfect storm' by 2030.

Strategic Challenges for Natural Resources Management: Soil erosion, Preventing Degradation Depletion of Water Resources, Developing Wild Life sector, Controlling Air Pollution and Managing Climate Change, Controlling Population Growth, Role for B – Schools

India's industrial growth has been instrumental in setting up B – Schools throughout the country and also with a growing number of B – Schools has facilitated further industrial and business growth. The B – Schools are better placed to take up the strategic challenges listed above with their spread and the expertise that they have.

Case study of JDC Bytco IMSR: The JDC Bytco IMSR, Nashik has taken initiative since 2004 to conserve and preserve one of the most crucial Natural Resource viz. water. Many projects and awareness programmes have been undertaken involving teachers, students and the stake holders.

Conclusion: It is necessary to examine how better environmental management can contribute to human security, including sustainable livelihoods, resilience to disasters, peace building. This needs to be facilitated through partnerships and by involving educational institutions.

RURAL DEVELOPMENT MANAGEMENT

RDM-01: **Incorporating risk and disaster management into rural projects**

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Risk and disaster management are important for rural development. Rural regions are vulnerable to disasters. These disasters have a devastating impact on the rural economy. Rural sectors such as agricultural production account for a large portion of the GDP in developing countries. Thus, any loss in rural economy results in heavy losses for the national economy. The disasters have both immediate impact such as death and hunger and also long term impacts such as psychological impact on the survivors. An example is the 2004 tsunami. According to the World Bank estimates, India suffered agriculture and livestock damage of US$ 37.51 million and fisheries damage of US$ 567.8 million. This paper describes ways to incorporate risk and disaster management into rural projects. The paper gives a brief description about different disasters that can affect rural regions and the subsequent impacts that they can have on the economy and development. Real life examples are presented which provide further understanding of the above mentioned risks. The paper gives a detailed description of the different ways for efficient implementation of disaster risk management such as risk identification and early warning systems. It also addresses the issue of carrying out this implementation in a cost effective manner. The results of a survey are also presented which was carried out among residents of a rural region to know about their level of awareness towards disasters impact and risk management. The main objective of the paper is to explain the connection between disaster risk management and rural development.

RDM-02: **Rural development and poverty alleviation programmes: approach and strategy**

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In India, 836 million people are poor and vulnerable. Poverty alleviation programmes have to be viewed in the wider perspective of socioeconomic transformation in the country. While the present strategy of direct attack on poverty through specific poverty alleviation programmes is justified on account of insufficient percolation of benefits to the poor from overall economic growth, it should be appreciated that the strategy of direct attack on poverty cannot be sustained and would not yield the desired results. The economic betterment of the poorer sections cannot be achieved without social transformation involving structural changes, educational development, growth in awareness, and change in out-look, motivation and attitudes. The social framework should be such as to provide opportunities for the poorer sections to display initiative and to stand on their legs. However, the experience of the working of poverty alleviation programmes is by no means uniform in the country. In general, the performance of IRDP has been better in the relatively developed regions which are well provided with infrastructure and where level of awareness among the beneficiaries is high. Even in the less developed areas, performance has been satisfactory wherever special efforts have been made. The total impact of the programme depends on the degree to which the different poverty alleviation programmes, including the Minimum Needs Programme (MNP), TRYSEM, SGSY are integrated with one another and with the overall development of the area. The paper also discuss the demand for goods and services produced by the poorer household enterprises rises significantly in response to the overall increase in incomes in the country so that the viability of these household enterprises depends critically on the sustained increase in national income. This paper also stress upon that it is necessary to ensure that the pattern of overall economic growth itself is such as to generate adequate incomes for the poorer sections through its greater impact on employment generation.

RDM-03: **Flood and riverbank erosion: the developmental threats for Malda district, West Bengal**

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The Malda district in West Bengal is a highly flood and riverbank erosion prone area of India and has been witnessing devastating flood and riverbank erosion since last four decades mainly caused by the river Ganga. Flood and riverbank erosion went a space washing out of spurs, refined embankments in tandem and the fragile measures taken so far failed to secure impact on the rate of riverbank erosion and in effect led to loosing more geographical and political areas of the district. Periodicity of flood and riverbank erosion continuing unabated has thrown the existence of many habitat into an unworthy situations. The river Ganga in its meandering belt is slowly shifting its course of flow direction tangentially inside Malda district eroding the lands of Malda district, that of West Bengal. Continuous soil erosion and embankment cutting has, however, led

to loss of important settlements, mango orchards and highly productive agricultural lands which are usually subject to multiple cropping. Annual flood not only responsible for havoc loss of properties, settlements and prime agricultural lands but affects lakhs of people, making them flood refugees, turning Malda most environmentally disaster prone and environmentally degraded district of West Bengal. Recurring flood and riverbank erosion in these areas used for various socio-economic activities produces a variety of negative impacts including environmental, ecological, sociological and economic sectors. The magnitude of adverse impacts depends on the vulnerability of the zone and population and the frequency, intensity and extent of flood and riverbank erosion. After losing their productive lands owing to riverbank erosion, most of the flood victims lost their livelihoods. As people loss their settlements and agricultural lands, economic activities come to a standstill, resulting in dislocation and the dysfunction of normal life for a period much beyond the adverse affects of flood and riverbank erosion. Similarly, the direct effect on production assets, be it in agriculture or sericulture, mango production, pisciculture, can inhibit regularly activity and lead to loss of livelihoods. The continuous flood and riverbank erosion damages to the infrastructures, settlements and productive lands also cause long-term impacts, hindering economic growth and development in those flood affected areas. Recurring economic cost of relief and recovery adversely impact investment in infrastructure and other development activities in the area and in certain cases are crippling the economic development of the flood and riverbank erosion disaster prone areas of Malda. Recurrent flooding in a region may discourage long-term investments by the government and private sector alike. Lack of livelihoods, combined with migration of skilled labour and inflation may have a negative impact on a region's economic growth. Loss of resources can lead to high costs of goods and services, delaying its development programme. These problems are variegated, one is linked with the other and one creates the other problem. In this paper the quantitative and qualitative analysis of flood and riverbank erosion damages and related developmental problems are discussed in details.

RDM-04: **Role of innovative techniques in rural marketing**

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The next few years of the new millennium will belong neither to the urban markets which have reached saturation and where margins are under pressure nor to the export markets, which suffer from inadequate infrastructure back home, and uncompetitive prices overseas. It will belong to rural marketing. A debate is continuing for a long time amongst the Indian marketers, both practitioners and academicians, on the justification for existence of the distinct discipline of rural marketing. Consequently, two schools of thought emerged. The first school believed that the products/services, marketing tools and strategies that are successful in urban areas, could be transplanted with little or no modification in rural areas. It perceived rural India as a poor extension of urban India. However, the second school saw a clear distinction between urban and rural India, and suggested a different approach, skills, tools and strategies to be successful in rural markets. But, the recent successes and failures of the corporate world in the rural market have clearly demonstrated that the rural market is a totally different proposition and not just a

poor extension of the urban market. What differentiates the two markets is not mere income, but a host of other infrastructural and socio-cultural factor. Thus, the rural market cannot be tapped successfully with an urban marketing mindset and would definitely require its thorough understanding. In other words, our approach towards rural markets needs to be distinct from the one adopted for urban markets. Against the backdrop of such a market environment, marketers need to design creative solutions to achieve success in rural markets. The problems of physical distribution and channel management adversely affect the quality of service (delivery) and cost. With poor or even no means of communication to exchange information with rural consumers directly, the success of a brand depends largely on the village retailers. Therefore, rural marketers have felt a great need to overcome the existing limitations across business stages in general and distribution in particular. India's villages need continuous innovations to make the giant leap forward. Corporate India and government bodies alike have made several efforts to bridge the gap between rural and urban India.

RDM-05: **Odyssey toward other India: a critical appreciation of the Pradhan Mantri Gram Sadak Yojana**

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A project undertaken by Ministry of Rural Development, Government of India, *Pradhan Mantri Gram Sadak Yojana* refers to a hyperlink between modern civil(ized) world and its indigenous counterpart. Nomenclature is problematic in a sense that project abovementioned is not meant for organized village. India reaches certain destinations of its development agenda to attain access to most of its hamlets in rural *Bharat*. Thus rural *Bharat* is left out of this project- no wonder that Union of India undertook the venture despite construction of all-weather roads as a means of communication being part of Entry 13, List II of Schedule VII to the Constitution of India. At bottom, however, the same may be construed otherwise as part of our development agenda. While means of communication including road for civilian use are so placed under the Entry abovementioned, Union of India has *suo motu* initiated this. In such perspective, *gram sadak yojana* which excludes rural *Bharat*, except a few- too few- remote hamlets, seems meant for the indigenous India which seems 'incredible' in true sense of the term. Such reasoning finds support in expression of official documents, viz., habitation, cluster, connectivity, through routes, link routes, etc.- another India within the topography of mainstream corporate India- a heterotopia. The author hereby puts forth that under the guise of official agenda vis-à-vis rural development, this is a project of globalized India toward discovery of India, not for public interest, but for interest of corporate India. In the wake of globalization, Indian antiquity and indignity seems to be a treasure trove, which is saleable commodity all over the world. Thus the *yojana* may not be a mere coincidence but part of larger development agenda of globalized India to explore traditional knowledge, cultural expression, etc. The proposed all-weather roads is thereby meant for two-way process- to offer minimal infrastructure support to indigenous communities overdue long back and, at the same time, to secure access to other India that is *Bharat*. Thus whether and how far the *yojana* is meant for the sake of rural development is a matter of conjecture.

RDM-06: **Business opportunities and challenges in rural Rajasthan and role of Pump Priming Theory**

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Rajasthan is largest state of India and it is the land of businessmen; but on the basis of industry it is a poor state. According to census 2001, the population of Rajasthan is 5.65 crore; so it is a big market. The population and per capita income of state continuously increase after economic reforms, so it has great opportunity for business organization to sale their product and services in rural area. But in Rajasthan state the development of industry is very slow because the positive factors which can attract the industrialists or investors are very few. It does not mean that there is no opportunity in rural area in Rajasthan for industrialists or investors in Rajasthan; sufficient land is available, money is available, skilled labour is available and market is available. There are various areas in Rajasthan which have great opportunities like tourism, agriculture, traditional industries, small and cottage industries and many other industries. Tourism sector continuously increase in Rajasthan and it has great future. After 59 years of independence, Rajasthan can not fulfill the dream to become an industrial state in spite of various government efforts. Because, in Rajasthan there are various difficulties in front of industrialists or investors especially there are various external diseconomies available. Because of these external diseconomies industrialists or investors do not attract and invest their money in the state even many of Rajasthani industrialists or investors invest their money in other states. If government provide for external economics for business than they can easily attract investors to invest their money in Rajasthan, for this government should use the pump priming theory. According to the 'pump priming theory' government should develop some infrastructure facilities in various areas; these infrastructure facilities will provide the external economics to businessmen and they will able to produce there product on less cost. In rural Rajasthan there are various areas in which we can develop export units. Government of Rajasthan also does various efforts but these efforts are not sufficient. So we should apply pump priming theory.

RDM-07: **Resettlement and rehabilitation strategies: the case of Majuli Island, Assam**

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Primarily applicable to the rehabilitation and resettlement of persons adversely affected by the acquisition of lands for development projects, Majuli, the world's largest inhabited river island has been shrinking in size over the years due primarily to the phenomenon of river bank erosion leaving only 421.65 sq. km of the island by the year 2001 rendering hundreds homeless especially during floods. Needless to mention, this accelerated rate of shrinking in the size of the island cannot be without its impact on the society, economy, demography and culture. An important dimension of the problem relates to redistribution of people on account of the loss of villages, agricultural land and other economic support base. The present study aims at assessing the

magnitude of the problem of redistribution in the island both within and out as the policies are biased to development related displacement. Using data available from successive census enumeration at the village level, from the year 1971 till 2001, the study measures the extent of population redistribution through an analysis of changes in the number and size of settlements, changes in settlement structure and changes in population distribution, density patterns and growth of population. It is hypothesized that the rate of shrinkage in the size of the island is directly related to an accentuation in the process of internal redistribution of population and/or out-migration of people and changes in settlement structure leading to greater proportion of large sized villages. By their high frequency, cumulative magnitude, destructive socio-economic and cultural effects, forced displacements recognized as a severe pathology of development of growing concern and visibility on international and national agendas. Massive socio-economic losses, to pain and suffering to growing resistance movements and also to policies and programs intended to restrict and temper their effects. A section, largely unable to find alternate source of livelihood elsewhere, however, may still remain within the island by shifting to another location within the island itself through the process of internal redistribution. The process of internal redistribution is likely to induce changes in settlement structure as many small sized settlements would then become bigger with additional people.

RDM-08: **Success status of government development programmes – an experience from backward villages of Cooch Behar district of West Bengal**

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Relative backwardness or progressiveness determines the areas for concentration of development efforts. To locate the areas where people in the lowest ranks of Human Development Index reside in West Bengal, various queries were run on the Census 2001 demographic data. As a result, a total number of *4,612 revenue villages* have been identified by the Panchayat and Rural Development Department, Govt. of West Bengal in 2004 as being the most backward in the state. Cooch Behar district also had declared 52 (fifty two) villages of this district as backward in two consecutive phases. Some extra developmental impetus has also been given in those villages to facilitate growth and prosperity. In this backdrop, the present investigation was undertaken in the backward villages of Cooch Behar District of West Bengal to study the success status of government development programmes running in the villages. The study was facilitated by the district development cell. A sample of 10% families was taken randomly for the study, except analyzing the secondary data obtained from ICDS projects and village Panchayet. An index called Composite Success Index (CSI) was developed for assessing the present status of success of the development programmes. The study revealed that the success of development programmes were low to medium in most of the villages. It is also revealed that success status is more where backwardness is more i.e. more backward villages achieved more success with respect to implementation of different development programmes.

RDM-09: **Management of rural development - a study of Nagaland**

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Rural development means desired changes in socio-economic conditions of the rural people both in quantitative as well as qualitative sense. It is a complete term which integrates a variety of human life and activities. We may classify the numerous elements as: (a) social, (b) economic (c) cultural (d) technological, and (e) natural. Rural development means desired changes in all these components, but such changes should take in a mutually supporting relationship so as to generate organic and optimum development. Nagaland is a vibrant hill State located in the extreme North Eastern End of India, bounded by Myanmar in the East; Assam in the West; Arunanchal Pradesh and a part of Assam in the North with Manipur in the South. Nagaland is the sixteenth state of the Union of India., inaugurated on 1st. December 1963. The total population of Nagaland in 2001 census was 1988636 with a decadal population growth of 64.53. The total rural population of Nagaland is 1635815 which cover 82.26% of the total population. Out of the total population 32.67% i.e. 649688 peoples are living below poverty line. So rural development requires added importance for the backward economy of Nagaland where agriculture alone contributes 25% of States domestic product. The most important activity is agriculture which occupies 68% of the workforce and 60% of the rural population depend for their income and employment in agriculture. The objectives of this study were - to study the effectiveness of management of various rural development programmes initiated by the state and central Government, and to propose possible remedial measures for better management of rural development programmes in future. Management of Rural Development can be viewed in a three dimensional sphere (D. K. Desai, 1983). One dimension deals with the area and activities such as agriculture, animal husbandry and other allied activities, rural industries, environmental planning including landscaping, area planning, and other infrastructural facilities like education, health facilities, sanitation and financial institutions. The second dimension deals with the people in rural area- small farmers, marginal farmers, rural artisans, agricultural and non-agricultural labourers and administrators. The third dimension deals with the process of management which includes policies, objectives, planning, project identification and formulation, resource management, personal management, organization, co-ordination, monitoring and implementation. In the state of Nagaland, with a vision to uplift the rural mass, the VDB was evolved and established in every villages of the state. Today there are 1278 functional VDBs in the state. The VDB is a unique agency operating only in Nagaland which has revolutionalised the process of development. The VDB is the authority to formulate and implement its own development schemes as per the need of the village and at the same time it selects the beneficiaries of the centrally sponsored schemes and handles its implementation. The study will establish that the various components of the delivery system are not well placed. The planning unit is running without trained manpower, infrastructure. The monitoring and evaluation unit of the rural development programmes of the state is very much weak and are unable to provide proper training to the beneficiaries. Creation of infrastructural facilities in the district is very poor, which aggravates poverty and degrades the rural standard of life.

RDM-10: **Integrating development and communication: challenges for rural development and ICT in post-liberalization India**

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In this paper I attempt to discuss the extent to which 'Information Communication Technology' or ICT has contributed in the rural development of India. The notion that ICTs are an exceptional technological intervention competent in confronting traditional barriers to social change and economic development continues to be the central pillar of ICT-based development initiatives in rural India. In contradiction to this commonly held assumption, the actual experience of several celebrated developmental ICT projects provide substantial grounds for reassessing the strategies and options of ICT deployment in rural spaces, since the implementation of information technology has not in itself led to any considerable transformation of the social and economic conditions of marginalized communities. This paper seeks to study selected communication projects for rural development, primarily in post-liberalization period and tries to explore whether the use of communication-technology has indeed benefited the Indian rural poor or whether, the "pro-poor" development issues have been pushed aside especially after liberalization, leading to proliferation of private broadcasting and ICT initiatives in favour of consumerism and entertainment. Moreover, the paper questions whether there is an undue emphasis placed on technology itself. The study focuses on the impact of both, a state led ICT initiative; and by a non-government organization, to identify issues and strategies critical to development and empowerment of socially and economically disadvantaged groups and communities in rural India.

RDM-11: **Impact of internet on rural development: a case study**

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One of the most major phenomena, affecting people today, is the revolution in information and communication technology (ICT). Central to this is the use of Internet. Today ICT constitutes the fastest growing component of the global economy and the Indian ICT spending is expected to grow 14 percent in 2010.However, the agriculture sector in most countries is out of this growth map and Internet access in these areas is usually very marginal if at all. There is a growing consensus that knowledge and information are essential for empowering rural communities. Relevance of use of Internet technology in agriculture lies in it ability to reduce isolation, facilitate dialogue, provide information and skills training and encourage orderly structure in the system. It is necessary to investigate how its use has contributed in the development of the agriculture sector through an exploratory case based study in India. This will be an exploratory study based on a background and research approach where Internet and participation will be the basic components, by selecting five experts in the field. The findings of the current study on the use of

Internet in agriculture have indicated several encouraging outcomes. Information related to scientific and better farming methods, weather, soil quality, fertilizers and pesticides has become more readily available to farmers. Further, the company using this technology has been able to get a steady supply of good quality produce and the model has been easy to replicate. Farmers appear to have benefited by the new method of trade and the recovery of their costs have become faster leading to less borrowing. Many farmers may have possibly been empowered with better knowledge and greater choices. They may have also learned to value information and scientific methods of farming for improving their quality and quantity of produce.

RDM-12: **Challenges in branding of commodities by producer owned brands**

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Commodity prices tend to emerge from interplay of demand and supply. An individual producer/ seller or even a group tends to be a price taker in a commodity market. The agricultural commodities futures market promoted by government has neither helped farmers in hedging towards price risk nor is its claim of better price discovery achieved. It is found that the brand less commodities cannot easily survive the ups and downs of markets and farmers are always at the receiving end. The only way in which a commodity can try and insulate itself from such vicissitudes is to create a loyal band of dedicated consumers. Theodore Levitt (1980) pointed out that "there is no such thing as a commodity. All goods and services are differentiable." The Indian economy is growing and there is rise in income levels in a sizeable population, who are looking for better quality commodities/products. The review of literature on Marketing suggests that one way to do this is to differentiate the commodity and move over to a product market. The marketer succeeds in asking for prices by creating various types of utilities. In doing so, s/he takes recourse to 'branding' such that the commodity becomes different and, hence customer identify the product and are prepared to pay the asked price. The producer share (agriculture produce) in consumer rupee is very less as the farmers and their organisations are unable to differentiate their products and make offers to consumers. With this being the plight of producers, with an interest to see higher returns to producer-farmers, one of the options is going for branding of the agriculture produce. This can be made possible through producer organisations, though there are different formats of produce organisations operating but few are successful. The study explores the available formats of the producers owned organisations and tries to identify the factors of success and the format which can be explored for replicating.

RDM-13: **Evaluation and analysis the rural development level in Shirvan Chardavool county of Iran**

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Rural development programs have 30 years background in Shirvan and Chardavool County of Iran. But there isn't any scientific study about the effects of these programs on the welfare of

peoples in these rural areas. Evaluation and analysis of the effects of programs is an essential step for decision-making about continue the program or reform it. In this study, the development stance of the rural areas of this county is measured with 51 development indices on county base, 14 indices in sub-counties within 1996 and 2006 and 10 indices on rural areas within 2006. The results show that: 57 villages are sorted out within totally well stated, 88 villages moderately well stated and 57 villages are ill stated. Also, it is exposed that the development gap and inequality of indices in sub-counties through the investigated time, have narrowed in some cases; but still there are gaps for the integrated and sustainable development.

RDM-14: **Base-line survey for Gobindabhog rice production status in Nadia district of West Bengal**

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Gobindabhog is an important aromatic rice landrace of West Bengal. Its area and production is going down due to large coverage of high-yielding varieties during last 3-4 decades. To assess its present status in Nadia district, a base-line survey was conducted during 2009 with 42 randomly selected Gobindabhog farmers of 4 blocks (*viz.* Chakdah, Ranaghat-I, Hanskhali and Krishnagar-I) through personal interview based on pre-structured schedule. Farmers belonged to General (47.6 %), O.B.C.(40.5 %), S.C. (4.8 %) and S.T. (7.1 %) categories have average land of 7.3 bigha, of which one-fifth area was allocated for Gobindabhog cultivation. About two-third of the farmers used own Gobindabhog seed and transplanted their seedlings before 15 July of each year. Chi-square test reveals that the average farmers used 3.3 kg seeds/bigha for sowing the seedlings @ 4.9/hill with a spacing of 17.3cm and obtained grain yield of 2.15 t/ha. Most (73.8 %) of the farmers used Gobindabhog rice for domestic consumption and rest milled their produce mainly for marketing with an average price of Rs. 20.2/kg in local markets.

RDM-15: **Securing rural livelihood through partnership based action research: the experiences from northern disadvantageous districts of West Bengal**

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The Districts of Uttar Dinajpur, Dakshin Dinajpur, Malda and Murshidabad of West Bengal are amongst the 150 disadvantageous districts of the country. Poor productive performance of agriculture and chronically inter-twined socio-economic handicaps are presumed to be the root

causes. Hence, a multi-stakeholders' partnership based action research project has been getting implemented in four identified clusters of those districts since 2008 under the aegis of Component-3 of National Agricultural Innovation Project (NAIP) that deals with *Sustainable Rural Livelihood Security* aspects. The research interventions have so far led to 14% increase in cropping intensity, introduction of new crop varieties over nearly 17% of the gross cropped area as well as 10.6% and 15.7% average. yield increase for field and horticultural crops respectively with 40% reduction in disease-pest attack. Introduction of RCTs has attributed to 24.26% and 9.3% average increase in yield for wheat and lentil respectively along with 23.21% reduction in irrigation water demand. Due participatory planning on contingent farming with food legumes and other short gestation leafy vegetables has helped mitigating the threat of crop loss for winter and summer rice. Interventions with multi-tier horticulture and pond dyke management technologies for homestead based situations and involving women partners have led to 94% per capita increase of vegetable consumption in daily diet. Activities concerning bio-inputs production through putting in place 42 nos. of units and involving 102 nos. of community partners has led to creation of monthly production capacity of 10.5 ton vermicompost and around 8 ton microbial enriched compost. In fine, tailor made methodological approach, technology intervention by the partners as per their respective domains of core competence, positioning of two-tier research support engine viz. Gramodyog Samity and gender disaggregated production and market groups, creation of sustainability fund, and, importantly, institutionalization of the process intermediation are the key features behind such achievements so far.

RDM-16: **Rural livelihood security in the perspective of Employment Guarantee Act: a case study of Purulia district**

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The Mahatma Gandhi National Rural Employment Guarantee Act that is holistic in nature constitutes substantial amount of attention in the recent literature and socio-economic discourses. Gandhiji did not believe in the doctrine of 'the greatest well-being of the greatest number'. Rather, he advocated the concept of Sarvodaya which aimed at the greatest good of all. Undoubtedly, the National Rural Employment Guarantee Act has the potential to make the greatest good of all rural masses. But in the surveyed areas of Purulia district, one of the backward districts of West Bengal, the performance scenario of NREGA calls in question that employment guarantee scheme is a lifeline for the vulnerable sections. In Purulia district, rural area occupies 98.73 percent of total geographical area. The district has 36.56 percent of the total population in the form of SC and STs. And 93.8 percent of total population belonged to SC and ST live in rural areas. In the district, where around seventy percent of the people depend on agriculture for livelihood, a major share of the rural population is vulnerable to the vagaries of monsoon as an overwhelming share of the gross cropped area is rain-fed. NREGA were a creator of a social safety net for the rural people by providing a fallback employment source, when other employment alternatives are scare or inadequate in the district. But the fact is that the implementation of NREGA cannot solve rural predicament in the district. Rather, in the surveyed areas of the district, the rural employment guarantee status gives birth to doubt regarding the commitment to the Parliamentary

Act. If the district has to realize it's growth and development, it is imperative that this multitude of people be able to earn their livelihood in a sustainable manner. The present paper tries to portray, in the light of field investigation, the ground realities regarding the growth of sustainable livelihood security in Purulia district

RDM-17: **A study on monitoring the impact of Joint Forest Management on rural livelihoods in selected areas of Purulia district**

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The current context of natural resources management is characterized by an increasing involvement of local communities in managing the commons. In India, many communities have responded to the process of forest degradation by developing local arrangements that seek to regulate access and control over neighbouring forest patches. Joint Forest Management (JFM) in India is the largest such effort in the world involving the villagers and Forest Department at unprecedented scale. Although from the beginning the stated objectives of JFM were to improve the condition of forests and provide for the sustainable livelihoods of collaborating communities, the restoration and regeneration of forests in India has been more talked about than its impact on the livelihoods of the local people. In fact very few studies have attempted to use the village-level livelihoods indicators to know the impact of JFM on the livelihoods of the people which is necessary for the monitoring of livelihoods impact of JFM. Sustainable Livelihoods (SL) framework provides excellent scope to capture the multifaceted impact of development programmes on clients' livelihoods in terms of increase in their asset base and decrease in vulnerabilities. The study describes the development of a tool to assess the impact of Joint Forest Management (JFM) intervention in selected villages of the Ayodhya Hills of Purulia district, West Bengal and also shows the results of its field testing. The development of the tool followed a simple indicator-based multi-stakeholder approach taking SL framework as a reference. Conceptualisation of 'impact pathway' with continuous incorporation of stakeholder views helped to develop the tool, which was followed by the development of a 'perception analysis tool' to assess the impact of JFM intervention on the respondents using recall data. The field testing of the tool successfully captured the impact of JFM on peoples' assets and vulnerabilities. It also discriminated the successful Forest Protection Committees from the less successful ones. This type of indicator-based multi-stakeholder approach may be applied for the future impact assessment programmes by development agencies with requisite modifications.

RDM-18: **Challenges of rural backwardness in Khargram Block, District Murshidabad**

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Murshidabad District of West Bengal is one of the minority concentrated region. Rural poverty in the district is as high as 46.12 percent. It ranks 15th with respect to both Human Development

Index and Gender Development Index according to the West Bengal Human Development Report 2004. The study area — Khargram Block located in the southwestern part of the district is one of the backward blocks of West Bengal in terms of human and social development. Economic conditions in the block are no better. The female work participation rate of the block works out to be 12.89 percent compared to the male work participation rate of 51.26 percent (2001 census). Sericulture, an important cottage industry in the block has declined over the past few years. Due to economic impoverishment educational awareness is considerably low. The low level of literacy (53.23 percent) in the block signifies a spatial and a regional dimension. In the sphere of education, infrastructure development has not kept pace with the increasing school enrolment at the primary level. Considering other social parameters, for example food security, health, sanitation and access to drinking water supply, situation is even worse. Like other blocks of West Bengal, rural development programmes, capacity building, campaigns have continued to be part of the decentralized governance in this block, although its impact on the rural society is negligible. An attempt has been made by the author to analyse the backwardness status of the Khargram Block based on the backwardness parameters and study its impact on its rural society.

RDM-19: **Estimation of livelihood security: the socio-personal and agro-economic approach**

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The poverty across the world is simmering up ignoring all the myopic forecasting made by the scientists and intellectuals; and the brunt of this crisis would possibly be the worst in Indian economy. Cognate to it, the livelihood security, as perceived at least by 400 millions of Indian reeling under abject poverty, has certainly been the crux of the challenges. The present research work, conducted in the district of Purulia covering 100 rural respondents selected through multistage sampling, aiming at deriving some causal factors impacting cumulatively on the livelihood security, the consequent character of this study. The variables significantly impacting directly on livelihood security have been family members, education and fungicide application. The variables have then been undergone Principal Component Analysis approach for having an apparent conglomeration of exogenous variables. The other variables, recording substantial association with livelihood security, have been fertilizer application, irrigation status, fungicide application, and yield level. So, all these techno-managerial and socio-economic factors need to be brought under serious consideration for ushering policy formulation towards defending livelihood security, specially in a microeconomic set up.

RDM-20: **Identification of constraints in SHG environment**

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Rural women can be raised above poverty and policy planners are convinced that it can be achieved through strengthening small local groups of women. Group membership smoothens

rough edges and makes members more reliable. SHGs are currently seen as an essential and integral part within larger objectives of livelihood promotion, community development and women empowerment. Identification of growth promoters and growth retarders in the internal environment by the group itself, is of utmost importance as the analysis of these factors has great role in formulating policies on which group's survival and success is based. The internal environment analysis thus was one of the major objectives of the present study. The efforts were made to understand the various dimensions of internal environment of SHG that may be responsible for the success or survival of SHG. To achieve the objective the SHG leaders were contacted and the required information about their own SHGs was collected personally by the investigator with the help of a self developed tool – "Internal Environment Assessment Scale" (IEAS). The survey for the present study was conducted in rural areas of southern Rajasthan. The study of NGO SHGs was undertaken in one randomly selected district from zone viz. Chittorgarh (zone IVa). Analysis was done to find out SHG growth promoters and retarders within internal environment. The scanning of the relevant internal environmental trends can give an idea about the future threats and opportunities that can help government and non-government organization in formulating the strategies for the success and survival of SHGs.

RDM-21: **Contextualizing 'human security' in rural development in a conflict zone: a case study of Chhattisgarh**

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This paper looks into the whole discourse of rural development from the point of view of 'human security' in a conflict zone. It tries to examine the approach to development strategy as well as the voice of people in that context. It also tries to find out where do the 'sub-alterns' stands today in the context of development paradigm undertaken by the Indian state whose constitution categorically mentions about establishing the so called 'Socialistic Pattern of Society'. As a researcher in social science whatever my knowledge is from my academic reading, theoretical understanding as well as my experience from field visit to Bastar, I am trying to pen it down through this paper.

RDM-22: **Indian spiritual heritage key to rural development and answer to global crisis**

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India is a vast country endowed with excellent resources both human and natural. The need of the hour is proper utilization and equitable distribution to regain its position of greatness. Lakhs of crores of rupees are being spent for rural development by the government, NGOs and

corporates with indigenous and foreign funds still a vast majority of rural people do not have square meal a day and minimum shelter, healthcare or education, 50% living below poverty level. The root cause lies in Ex-Prime Minister Rajiv Gandhi's Statement– every rupee spent on poverty alleviation scheme over 85 paise did not reach the beneficiaries due to corruption and bureaucratic intermediaries. The globe is tottering under three menaces – Financial Crisis (governments' financial bankruptcy, corporates collapsing on scandals, crores of people ruined), Terrorism and Environmental Imbalance. The root cause of all these is keeping self-interest above common interest creating an environment of mistrust in the society. The answer to all above lies in the doctrine of Indian spiritual heritage which declares that each soul is potentially divine and the progress of civilization means the manifestation of this divinity in man. Hence three things are necessary – conviction of power of goodness, absence of jealously and suspicion, helping all who are trying to be and do good. For this required such men- "(H)e who has no enemy, friendly and compassionate towards all, free from feelings of 'me and mine,' even-minded in pain and pleasure and forbearing" – Geeta (XII-13). Swami Vivekananda calls for such men who are ready to sacrifice their everything for their country, sincere to their backbone. By following this culture India was global leader for thousands of years spreading civilization to all the countries who successively attained supremacy.

RDM-23: **Human development and its mobility: a study on some selected blocks of West Bengal**

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Human endeavour has always searched for welfare that transcends well beyond mere accumulation of wealth. An echo of this is found in the Brihadaranyaka Upanishad. In this Upanishad, Maitreyi raises a very important question about the problem and prospect of human life. When her husband, sage Yâjñavalkya wanted to give away between his two wives, Maitreyi asked if she could attain immortality with all the wealth of the earth. The sage replied in negative. Then she asked "What should I do with that by which I do not become immortal". This ancient question uttered long ago is still very relevant in today's world (Sen, 1999). In this paper, we have considered human welfare in the global era as captured by a set of socio-economic indicators. For this purpose we have selected all the blocks of five districts (Howrah, North 24 Parganas, Burdwan, Purulia and Malda) of West Bengal on the basis of ranking in West Bengal Human Development Report (2004) during the two Census points (1991 and 2001). For the analysis, we have considered both an aggregate and disaggregate approach. In the aggregate approach we have constructed a composite Modified Human Development Index (MHDI) for all the blocks of the five selected districts following United Nations Development Programme (UNDP) formula, used for the construction Human Development Index (HDI). This combined MHDI is a combination of three indices-an index of health outcome, an educational attainment index and an income index. The relevant data are gathered from Census Reports. The temporal movement of this MHDI is noted. On the basis of MHDI value, blocks are divided into four categories. For disaggregate analysis, we have used mean-proportions of the socio-economic indicators and their transition across the two recent Census points. The constructed mobility matrices reveal positional movement of the rural areas in this decade.

RDM-24: **Human resource management issues in livelihood promotion organisations in India: a critical review**

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Livelihood promotion organizations (LPOs) have spread enormously in the last three decades all over India. They include civil society organizations, government agencies, projects, and corporate sponsored entities. With this the number of people working in these organisations have also increased manifold. LPOs have a very different kind of need of human resources – characterized by a huge diversity and embedded in a complex web of contradictory spaces: the need of skill set ranges from technical to soft skills – but with an overarching entrepreneurial orientation; the area where LPOs operate do not have much competitive advantage in terms of running any business – due to several factors like lack of infrastructure, market etc.; the LPOs operate in a regime where aggregation and institutional mechanism is followed in principle; and the ability to pay of LPOs is less as compared to other business organizations (in general as compared to government agencies too). Many LPOs still have the volunteer forces as their main functionaries. Further the professionals/salaried persons working for these organizations are those who are motivated not by non-market inspirations like orientation to serve the poor, and other factors. Such a complex need of human resources in the LPOs limits the potential employees for hiring. Most importantly the LPOs are not always equipped with managing such a diverse kind of human resource leading to failure of the basic objectives of the livelihood promotion initiatives. Not only at the level of management, but in terms of our understanding of the situation also there is a large gap. This paper tries to bridge this gap through review of conceptual aspects as well as the current practices through literature review. The review highlights the 'special' nature of development sector organsations, and in particular the LPOs. It points out the inherent contradictions like voluntarism-professionalism that these organizations live with. Finally the paper recommends a few points as managerial/policy implications and suggests a framework that helps analyzing the situation better.

RDM-25: **Indian values and ethics in environmental and technical education in unorganised sector**

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It is time to ponder on why we should integrate human values and ethics with technical education. Engineering and technology can no longer be looked upon simply as specialized bodies of knowledge and skill. Instead, they have now become the most dominant force shaping the whole gamut of socio economic and cultural development. It is important to note that we have started realizing the importance of ethics and human values in our working culture. In order to achieve total human development in our country we need to strictly implement it in our thoughts and actions. The values have been inherited from the rich traditions of our spiritual knowledge

that forms the backbone of human civilization. Present technical education system has, however, not been able to pay adequate attention to the requirements of this nature. Therefore, if social and economic justice has to be achieved through the basic principles of our values and rich heritage, emphasis must be laid on the education and training of our manpower with strong bias on ethics, environment and employment. A large bulk of our population comprises the unorganized rural and urban youth who may be educationally and economically backward, dropouts or womenfolk. The present technical education system has, however not been able to pay adequate attention to the requirements of this sector. Therefore, if social and economic justice has to be achieved through the basic principles of our values and rich heritage, emphasis must be laid on the education and training of our manpower with strong bias on ethics, environment and employment. This paper attempts a critical discussion on the above issues.

RDM-26: **Strengthening of human resource in rural areas: some thoughts**

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Number of economists has predicted that in near future India is going to be an economic giant and even cross the economic growth of Asian major China. But as we know large number of people live in rural areas and without their development, dream to become an economic giant is impossible. Path of development in rural areas is not smooth rather full of barb with maximum hindrances. Problems in rural areas are well known to rural development experts. Out of these problems climatic changes and its negative consequences is one of the major bottleneck for sustainable agricultural development, the main vocation of rural masses. And in Health sector alarming spread of AIDS, and resurgences of many old disease in new form is now a major challenge, and also unavailability of jobs and huge disguised unemployment in agriculture create insurgency in some parts of the nations, mistrust of people on political institution and also governmental establishment is so alarming that it may break the democratic configuration of nation. Government of India had taken number of rural development programmes many times after independence, but models of rural development programme has repeatedly failed to achieve its desired outcome, the underprivileged remain neglected as usual and have to remain satisfied with twenty paises out of one rupee as allocated for them under rural development programmes. The very recent model of rural development i.e. Participation and Empowerment has not also brought expected development in rural areas. Actually without developing Human Resource of rural areas desired outcome cannot be achieved. Material resources depreciate every year in value but human resource appreciates in value by acquiring greater knowledge, experience and efficiency. Human resource management experts conceptualized that each human being is born as something new, something that never existed before. Each is born with the capabilities and limitations. Thus, there is a need to invest time, money and effort for the development of farmers and extension personnel attached to the rural development directly and indirectly. So, organization should give special emphasis for human resource management and development in rural areas. Human Resources Development organizations should also reorient under the perspective of

external and internal environment. The external environment comprises of the forces in the social, political, economic and cultural factors. The internal environment includes existing structure, technology, needs and expectations of its people and changing scenario of labour force.

IIRD-27: **Rural development through HR activities –with special reference to NGO's in India**

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Many HR approaches have resulted in the rural development of the nation. A central strategy of the rural livelihoods approach is to put people at the centre of development, thereby increasing the effectiveness of development assistance and therefore improving performance in poverty reduction. In addition to institution building, programme activities also include human resource development including skills development to build up the skills base of villagers, especially women. Income growth is promoted by increasing agricultural productivity through improved farming methods such as using drip-irrigation, provision of better seeds, creation and improvement of markets, land development, micro-credit, increasing off-farm incomes and supporting enterprise development. Women's empowerment has also led to them participating in the local political process. Long-term commitment is the key to creating sustainable impact. Consequently rural development programmes in India have now run 20 years and helped create replicable models that can be quickly adapted to a variety of contexts. AKDN's rural development efforts started in the early 1980s. Rural development programmes seek to contribute to rural poverty reduction through community involvement and empowerment. The Aga Khan Rural Support Programme (India), the rural development partner of the Aga Khan Foundation (AKF), a non-government development organisation, based in Gujarat, has its focus on enhancing rural livelihoods through sustainable management and use of natural resources in degraded and resource poor regions of western and central India.

RDM-28: **Rural youth in agricultural and rural development: a case study in Okara-Pakistan**

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Rural youth in Pakistan play very important role in the political, economic and social development of the country. It is time to create awareness among our rural youth about new technologies for adoption in the field of agriculture and rural development. Keeping in view the above fact the present study was designed in 2008 to ascertain self perceived role of rural youth in agricultural and rural development in district Okara, Punjab, Pakistan. The district comprises three tehsils

(sub-division) namely Depalpur, Renala Khurd, Okara. From each tehsil, one union council was selected through simple random technique. Two villages were selected randomly from each selected union council and 25 young males, whose ages were in the range of 15-25 years, were selected randomly from each these selected villages, thus, making a total number of 150 respondents. The data were collected with the help of a specifically designed and pre-tested interview schedule. The results showed that 88.0% of the respondents had an education from primary to matric (tenth examination) and above level. Slightly more than one fourth 28.6%, 25.7%, and 17.2% of the respondents were labourers, farming, farming and playing respectively. On the basis of conclusions it was recommended that first of all the educational level of the study area should be increased and to establish the cottage industry in villages so that maximum number of rural youth get employed there and initiate various agricultural development programmes for the betterment of rural youth.

RDM-29: **IKU groups in knowledge empowerment of rural communities**

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Unlike other sectors, modern advances in agricultural technology needs to be introduced in close coordination of farmers with sensitization, mobilization and facilitating to fully exploit the potential of such technology in society's best interest. The present paper describes how social interventions are put in place to enable rural people to acquire and imbibe knowledge of technologies appropriate to their needs and environment to implement technical interventions. It is in this context that CRIDA's NAIP project on "Sustainable rural livelihoods through enhanced farming systems productivity and efficient support systems in rainfed areas" which is an action research pilot project in selected village clusters of the 8 backward districts of Andhra Pradesh involving a consortium of institutions from public, private and NGO sectors. The project facilitates the farmers and other stakeholders to use the knowledge resources suitably designed for them based on the prior information needs assessment through knowledge Share Centres(KSCs) at farmers door step. The content of the ICT services is designed in a way that the information can be easily accessed with a finger touch even by the illiterates.It is also ensured that the information which is disseminated through Knowledge Share Centres of the project caters the real need of farmers, is easily accessible, timely available and contributes to farm productivity. In order to enable rural people, who are largely dependent on natural resources base, to access information and knowledge leading to improvement in their livelihoods a three tier institutional mechanism was developed in the project and put in place in all the eight clusters. From project experience it was realized that institutional mechanism particularly information and knowledge utilization groups (IKU groups) formed in the project sites was key instrument in creation of enabling environment by strengthening social capital, which played a complementary and catalytic role on accessing information on technical interventions and latest updates in rain fed agriculture.

RDM-30: **Social entropy and system theory in the light of knowledge management**

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Distortedness and chaos are the intrinsic character of any system and with no exception to social system. When entropy gets increased, the system functions are adversely affected. In the analogy of law of thermodynamics as applied in the physics of heat, the widening gap between energy consumed and work done by a system has been resultant to increase of entropy and chaos. This paper examines in an innovative manner to apply this law of thermodynamics in assessing the social entropy, the parameter being widening gap between motivation unleashed and achievement made by a farmer or by any person per se. The continuous flow of exotic knowledge or imposed skills in to the mind and capacity of rural recipients of technical information and skills has implanted a stage of "restlessness" in the classical knowledge system. Many a times the transfer of technology approach (TOT) keeps on ignoring or downsizing the logical rejections or truthful culmination of economically or socially redundant technology. If technology transfer process goes on dejecting the people's indigenous knowledge, the consequences are of two types – (i) a logical withdrawal from the proposed project of change and (ii) an active resistance to the proposed interventions. Thus the present study has meticulously examined the consequences of rejection, discontinuance, non compliance, disagreements, resistance, reinventions in the light of anti transfer concept and an alternative paradigm has been created can be branded as knowledge socialization process.

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