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DESIGN OF RESOURCE USE : CASE OF JATROPHA-BASED BIODIESEL IN INDIA

Satyendra Nath Mishra*

ABSTRACT

The biofuel programme was promoted around the globe with mandate of decreasing the dependency on petroleum oil, reducing green house gas emissions, increasing agricultural profitability and as option for rural employment and development. There existed acceptable and popular perception that biofuel production is more economical to reduce petroleum oil dependency and green house gas emission primarily. However, this scalar approach is not found to be uniformly applicable across the world. The exploration of political economy of different regions provides varying priorities for promotion of biofuel programme based on the context, type of feedstock under use, technologies employed and the health of the economy.

The issue is not very different for India. Policy documents of government of India mentioned that local level institutions would be given responsibility for resources planning and development through the involvement of panchayat, providing first hand right of resources to local user and priority to local energy use and self-sufficiency. However, at the same time policy remained silent on technology inputs, research and development and institutional support for achieving objectives set for the local level sustenance for resource use and design. Policy became biased toward transport sector with announcement of mixing of biodiesel with petroleum diesel. Based on the meta-analysis of the existing literature this study raised basic questions toward the policy aim and ambition of jatropha-based biodiesel programme in particular for India and biofuel programme across world in general.

Introduction

It would not be wrong to put forward the dilemma of biofuel¹ development in Indian and other developing countries in following lines 'is the fuel driving the economy or the economy driving the fuel.' At first level, for everyone, it is like chicken and egg problem. But a logical scanning of political economy of different regions of world provides varying answer based on the context, type of resources under use, technologies employed and the health of the

economy. The increasing emphasis on biofuel to overcome oil pool deficit, decreasing greenhouse gases (GHGs) emission, employment generation and agricultural profitability has gained momentum in last two decades and its relevance as commodity for global trade (Gonsalves 2006; Staley and Bradley 2008). United Nation Conference on Environment and Development (UNCED) in 1992 passed 'Agenda 21' and called the international community to find more efficient

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systems of producing, distributing and consuming energy, which should be environmentally sound with emphasis on renewable options (Goldemberg and Johansson 1995). This is more important in present context, as world is facing problem of environmental issues and uncertainty of fossil fuel availability due to geo-political reasons. Oil crisis of 1970's and issue of climate change had played a pivotal role in acceptance of renewable energy options and developing appropriate technologies. This had led to substantial scale up, investment and advancement on all fronts of renewable energy technology development and uses. An increase in magnitude of petroleum energy consumption in urban / rural areas is considered as one of the important (measurable) variables for human welfare which had underplayed the importance of other energy resources as measure and motor of overall development (Cabral et al. 2005; Goldemberg et al., 1988).

Biofuel [by] product production and uses remained in controversies and a matter of investigation for researchers across many disciplines (Kher 2005; Maheshwari 2008) for allocation of scarce resources like land and water against food production (Braun 2008; Mitchell 2008). Studies have shown that biofuel which are produced on wastelands, marginal lands and on low input grasslands could reduce GHG emission and can be economically and ecologically viable in long run (Hill et al. 2006; Tilman et al. 2006). Brazil and United States (US) accounted for about 70 per cent of world bioethanol production by using sugarcane and corn, respectively (Staley and Bradley 2008). Europe (dominated by Germany and France) accounts for about 80 per cent of biodiesel production of world by the use of used rapeseed oil, cooking oil and sweet sorghum (Deurwaarder 2005).

In the above context this paper is an attempt to examine the simple question of what, why and where of biofuel development in general around world and biodiesel

development in particular in India. Meta-analysis of literature was done to probe these questions and issue of concern had been raised in the discussion section.

World Scenario of Biofuel Development

Biofuel development in countries like Brazil, US and EU had got thrust either from one or / and more of these factors, viz., i) oil crisis of 1970s, ii) to develop new avenues and markets for agricultural outputs and iii) environmental concerns (Demeritt 2001; Rajagopal and Zilberman 2007). However, the primary motive for the biofuel development has not been same for all these countries / continents. On one hand, oil crisis of 1970 hit the economy of many countries which are dependent on imported oil and on other hand, it led to the exploration of alternative energy options around the world. This had led to the development of efficient technologies, processes, for the use of renewable energy. This was supported by the investment in Research and Development (R & D) and formulation of supportive domestic, national and international policies.

In 1975, after the oil shock, Brazilian government launched a programme named 'Pro-Alcohol', to promote sugarcane based ethanol with purpose to restrict high import bill, negative growth and high inflation. In addition to fuel security, the support to sugarcane based ethanol production was also due to the non-availability of hard currency with Brazil at that time and to give impulse to rural employment, by revitalising the sugar industry. PETROBRAS, the state owned Oil Company of Brazil played a proactive role in linking the supply chain of ethanol production from farm to pump. Small-on-farm ethanol distilleries were provided to build on-farm institutional pillar for small farmers who produced about 30 per cent of total sugarcane produce. Favourable climatic condition of Sau Polo for sugarcane cultivation proved boon for Brazil. Sau Polo region accounted for more than 70 per cent of sugarcane and ethanol production (Abramovay 2008). By 2006, sugarcane-based

ethanol constituted 30 per cent of Brazil's total energy matrix, mostly fueling transport and industrial sector (Mol 2007; Sennes and Narciso 2008). The success of Brazil is an exemplary case for the world in general and developing country in particular. According to Staley and Bradley (2008), the success of ethanol programme in Brazil can be attributed to the adjustment of state, industry and technology development as per countries' own requirement of energy, in synergy with sugar industry, rather than being pushed by the international development organisations. The synergy of sugar industry to produce sugar and ethanol had led to the improved technology over the year for electricity and heat production for industrial use. During the initial phase of Pro-Alcohol programme Brazilian government had given tax breaks and social labels to sugarcane industry on purchase of raw material from small farms (Abramovay and Magalhaes 2007). This had led to more inclusive approach of development for agriculture and self-sustaining energy matrix in Brazil in last 40 years. In 2006, Brazil produced about 33 per cent (~17 billion liters) of world's total ethanol production. The production has been supported by about 330 sugar industries, with average production of 1.2 million tonnes per year. However, the ethanol programme in Brazil is not out of political debate and scientific investigation, as it has raised the problem of increasing land concentration, issues of monoculture and huge subsidy to industry over the years (Rothkopf 2007).

EU initiative on biofuel production came in 1992, with reform in Common Agricultural Policy (CAP). In 1992, under CAP farmers were allowed to grow non-food crops on set aside land for income generation which are not in use for agricultural purpose (Henniges and Zeddies 2006; Kojima, Mitchell and Ward 2007). In May 2003, the European Parliament and the Council had adopted the 'Directive on the Promotion of the use of Biofuels or other Renewable Fuels for Transport'. The directive stated that the member states have to replace minimum of 5.75 and 10

per cent of fuel requirement for transport fleet using biofuel by 2010 and 2020, respectively (Deurwaarder 2005; Laak et.al. 2007). The motive behind promotion of biofuel in Europe was i) sustaining the farming activities, ii) reducing the cost of farm support policies, iii) to diversify energy supplies and iv) creating a value added product and employment in countryside. The issues of reducing the GHG emissions, net production cost and energy efficiency of the biofuel crops remain in controversies in Europe, in comparison to the biofuel crop grown in Brazil or in other countries. In spite of that, biofuel production has gained momentum in Europe as the farmers had gained in the process, viz., i) revised CAP allowed farmers to grow energy crops on set aside land, which otherwise would have to be fallow, with ensured earning of about € 100 to 500 per hectare, ii) the dung from high density animal husbandry activities is profitable now, as the dung is used as manure in biofuel cultivation, iii) a premium of 45 was paid per hectare for assisting energy crop plantation and iv) biofuel production had led to stronger prices for agricultural commodities due to requirement of feedstock (Henniges and Zeddies 2006; Kojima, Mitchell and Ward 2007). However, in 2007, EU had revised its CAP guideline on subsidy to the 'set aside' land in wake of increasing food prices (Waterfield 2007). The increase in the global food price in 2012 was attributed to the increasing demand of biofuel from EU (Kelly 2012). Viewing this, EU had reduced its target of 10 per cent of biofuel production for transport to 5 per cent by 2020 from raw material like wheat, rapeseed or soya (Bauwens 2012).

The transport fuel in US is dominated by gasoline, which makes ethanol derived from the corn a favourable option as renewable energy source. The US ethanol industry has been protected from the foreign competition (especially Brazilian ethanol obtained from sugarcane) since 1980 under Ethanol Import Tariff. About \$0.54 per gallon of tariff is levied on

imported ethanol. The issues of subsidies and regulation on US biofuel programme have been more complex than other countries. This was due to the nature of raw material used, viz., corn, for ethanol production. It is an agriculture crop used as staple food. The post-production tax credits and relaxed fuel efficiency for flexed vehicle is more favourable in US than in any other country (Staley and Bradley 2008). About 95 per cent of ethanol produced in US comes from corn, which is heavily subsidised. From 1995 to 2010 corn had received the subsidies of around \$89 billion, against \$38 and \$34 billion for wheat and cotton, respectively². US policies support the ethanol industry from both supply and demand side. On supply side, heavy agricultural subsidy is provided which led to low cost feedstock. On demand side, mandatory blending and tax incentives on consumption enhances sales of ethanol in open market. The Energy Policy Act of 2005 had given direct support to ethanol programme through Volumetric Ethanol Excise Tax Credit (VEETC) and tax credit of \$0.51 per gallon of ethanol mixed with gasoline (Koplow 2006; Staley and Bradley 2008). US Farm Bill 2008 had increased the support for biofuel programme from \$2.5 billion in 2002 to \$7.14 billion in 2008. Section IX on Energy of US Farm Bill 2008 had supported 'Biomass Crop Assistance Programme', which provided 75 per cent of cost for establishing an eligible bioenergy crop. Also support had been provided in terms of annual payments for production and matching payments of up to \$45 per tonne for two years for collection, harvest, storage, and transportation for raw material to a biomass conversion facility³. On other side, the potential of corn based ethanol to reduce the GHG emission has been in debate and questioned (Searchinger, et al, 2009; Tilman et al, 2006). Also concern has been raised on link of corn being used as feedstock and rising food prices international market, which hits the poor and the poorest of world most (Braun 2008; Babcock 2008). This protectionist policy and trade options of US to run its biofuel programme indicates the mandate for making the agriculture

and related bio-energy production more viable and profitable financially, irrespective of environmental concerns.

India on Biodiesel Path

In 2003, Government of India came up with 'Report of the Committee on Development of Biofuel', to promote biofuel (ethanol from sugarcane and biodiesel from *Jatropha* and *Karanja*) on wasteland. Biodiesel programme has been able to catch attention of different stakeholders due to the requirement of huge and scarce resources from the hinterland of country, viz., wasteland, manpower for employment and other related inputs, with emphasis on fulfilling the guzzling fuel requirement of transport sector (Planning Commission 2003). The rationale given for biofuel development was its role as alternative to petroleum fuel for transport sector, environment-friendly in checking green house gases (GHG) emission and generating employment options in rural areas (Bhojvaid 2007; Kher 2005). The Planning Commission report had drawn a two-phase developmental programme to promote biodiesel from *jatropha*. First phase involved demonstration project (from 2003 to 2007) for plantation of *jatropha* on wasteland, through Joint Forest Management (JFM) and non-JFM approach, across eight compact areas⁴. Based on the assessment of first phase, the second phase (from 2007 to 2012) envisioned that villagers would take up the plantation work at community level, with institutional and financial support from government⁵. Chhattisgarh, Madhya Pradesh, Rajasthan, and Uttarakhand have constituted separate biofuel development boards for the promotion of biofuel plantation and uses. Also government has approved the long awaited National Policy on Biofuel (in September 2008) to expedite the development of biofuel in near future.

The Planning Commission (2003) approach toward biodiesel programme got mixed reaction in terms of selection of

feedstock and promotion of plantation on wasteland. Report mentioned that local level institutions would be given responsibility for resources planning and development through i) the involvement of Panchayat, ii) providing first hand right of resources to local user and iii) priority to local energy use and self-sufficiency. However, the report remains silent on how to mobilise and use the local / regional resources for local / regional energification process. On the other hand, all financial and environmental standards stated in the report are of transport sector, showing the one way scalar approach of state resource mobilisation for R & D and biodiesel production. Biodiesel Purchase Policy (MoPNG 2005) had given rights to oil marketing company for purchase of B100 (with effect from 1 January 2006) from local produces and entrepreneurs at INR 25 per liter. The policy had raised concern about large land ownership by big industries but provide no measures to check them or to empower the involvement of Panchayat through the formation of local institutions or Rural Business Hub. Also the 2003 report can be criticised on been overlooking the basic research to support the bioenergy crop varieties across different agro-climatic zones in India. The target of harvesting 65 million hectares of wasteland for biofuel cultivation had been criticised on the ground of being encroachment to the commons of poor people, who depend on it for day-to-day activities, livings and requirements (SPWD 2007).

National Policy on Biofuel 2008 had targeted the blending of biofuel (ethanol and biodiesel) up to 20 per cent by 2017. Also the report had encouraged the biodiesel plantation on community / government / forest wastelands, while plantation on fertile irrigated lands would not be encouraged. The Minimum Purchase Price (MPP) of bio-ethanol was based on the actual cost of production and import price of bio-ethanol. For biodiesel, the MPP was linked to the prevailing diesel price in retail market. Also the National Policy on Biofuel envisages that biofuel (namely, biodiesel and bio-ethanol) may be brought under the ambit of 'Declared Goods', by

the government to ensure unrestricted movement within and outside the states of India⁶. On one hand, the MPP for biofuel was welcome step to grower for diversifying the revenue generation options; on other hand, unrestricted movement of biofuel may open it to be influenced by market fluctuation and may defy the developmental goal of rural employment, agricultural productivity and energification in long run. However, the assessment of programme implementation and its socio-economic impact required a detailed and comprehensive study.

The Design Aspect of Biofuel Development

This section gives an overview of approach which had been followed by the major biofuel producing countries / continents. The biofuel programme of EU and US can be characterised with emphasis on i) centralised production approach, ii) large land requirement which varies from 1,000 to 4,00,000 hectares, and ii) huge farm subsidies. This design stems its origin as market oriented, protectionist trade with profit motive for fueling the transport need. On the other hand, Brazil adapted a mixed bag of approach with decentralised way of acquiring raw material and centralised way of final processing to produce ethanol. In Brazil, 70 per cent of land under sugarcane cultivation was owned by the 340 industries, while rest of the 30 per cent was owned by about 60,000 smaller farmers having average landholding of about 27.5 ha (Cotula, Dyre and Vermeulen 2008). Over the years Brazil's ethanol programme had led to the two-pronged social change. First, the technological innovations led to the expansion of ethanol boosted high skilled job opportunities with positive spin-off in many regions and sectors. Second, it led to the concentration of land and wealth in hands of few industries or corporations (Abramovay 2008). To overcome this design flaw of ethanol programme, the National Programme for the Production and Use of Biodiesel (PNPB) of Brazil had charted out steps for the inclusion of small and low income

farmers. This was done through setting up of favourable institutional arrangements, public subsidies and capacity building, in the supply chain of biodiesel. This would have been impossible for the small producers who were not well organised. This is aptly put by Abramovay and Magalhães (2007: 17) as:

‘The arrangements stimulated by the PNPB contribute for creating new patterns for the inclusion of low income farmers in dynamic markets. Such conditions are met by three basic political components: a new organisational model, new technical productive standards (by the use of new products) and strategic models of social responsibility on the part of the companies.’

This indicates how biofuel policies have been matured, learned and unlearned in Brazil, for more inclusive growth to suit their own socio-technical and economic environment.

The roles of international organisations have been controversial when it comes to harvesting energy to support the guzzling requirement of developed country (Margonelli 2008)⁷. The development of biofuel programme in African and Asian country seems to be no different at present. The issue of big versus small biofuel projects is already under debate and controversies. Under the guideline and financial support from the international organisation, the developing and third world countries have not got any chance to design the resource use as per their own requirement. Till now the biofuel story had mixed outcome with less of success and more of failure and controversies. This raises the concern for researchers, policy students and planners to investigate of what are the constructs that are favouring or not favouring the biofuel development in a given context.

The few small scale projects in African countries, like, in Mali, Mozambique, Burkina Faso, Ghana, Guinea and Senegal, are running successfully due to following reasons, viz., multipurpose approach of biofuel project for

energification rather than electrification only, participation of local communities, women's participation, small land requirement of about 10 to 150 ha with catchment of 20 to 50 square kilometers, decentralised approach and multiple stakeholders (Jongh 2006; Henning 2000). Small scale success story on local innovation and use of biodiesel from *Jatropha* and *Karanja* was also observed in India like, Powerguda and Chaloadi village in Adilabad district of Andhra Pradesh, Gardih village in Bokaro district of Jharkhand, Gudiyattam in Vellore district of Tamil Nadu and many more to count. The commonality of these success stories is realisation and involvement of local people to use the resources as per local requirement with support of indigenous socio-technical system. On the other hand, the development of large scale project in African and Asian continent was marked with i) targeted production of biofuel for transport fuel, ii) coercive approach by the state and industries for land consolidation (varies from 1000 ha to 400,000 ha) and other resource mobilisation, and iii) large scale displacement of people (Cotula, 2008: 36). Biofuel project in Indonesia, Brazil and Colombia are facing the problem of land consolidation, land allocation, land tenures in addition to social acceptance by the local people (Peskett et al. 2007; Rothkopf 2007). Conflict on local land rights and access to resources has been in question for biofuel projects in Africa, Latin America and Asia (Cotula 2006: 62). Eijck and Romijn (2008) had also raised the concern regarding local use versus export of biofuel in international market.

If this trend is not checked at early stage, the issues of small versus large scale production of biofuel can be a cause of rift between the local people, the industry and the State. This is particularly important when in developing and third world countries, where land to people ratio is too skewed, agriculture is labour intensive and people are dependent on commons for not only income but also food, fuel and fodder to larger extent. The issues of undefined property rights

in India and in other developing countries will only aggravate this problem⁸.

India's Rural Energy Scenario and Placing of Biodiesel

Rural energy system remained an unsolved mystery for planners and developers, even after more than six decades of India's Independence. Rural energy system is unlike urban one where access to electricity, Liquefied Petroleum Gas (LPG) connections and petroleum products fulfill and define the energy statistics. The energy matrix and its uses in rural area is wide, complex and socially embedded in contextual details⁹. Reddy (1999) has rightly recognised that rural energy has become an abandoned priority. The planning and policies to fulfilling the need of rural energy remained piecemeal, rather than prioritising, having bias toward urban users. In 1970s the primary focus of rural energy was on providing efficient cook stoves, which remained partial success. The case of biogas movement was also not very different. With initial success of pilot stage in 1980s, the movement lost its pace in 1990s, due to number of reasons naming few are flaws in design, bias in subsidisation and distribution of biogas plants, regional variation of dung availability etcetera (Dutta 1997). Under Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) by 2011 about 91 per cent villages (~537,947 villages) were electrified. This covered about 56 per cent of rural households (~about 7.72 crore). While as per 2001 Census of India, only 84 per cent of villages were electrified¹⁰. The number of households that were electrified in 2001 were about 43.5 per cent, leaving apart the quantity and quality provided (Das 2006; Gouri 2007). On positive side, RGGVY was able to create the physical infrastructure for the village electrification. However, the quality, quantity and who is and how the services are used is still matter of further exploration (Dixit and Sreekumar 2011). Also these need is need of conscious effort, so that these electrification drive at village can not become a show for

influential people for agricultural purpose, leaving behind the small, marginal and landless (Reddy 1999). The electrification drive under RGGVY emphasised the unitary approach of village electrification rather than village energification for overall energy security.

Revelle (1976) had opined that rural India's energy system is partially closed, which is powered by the photosynthesis and can be disrupted in future by rapid population growth. However, the list of disruption has increased to include administrative apathy, lack of regional / local / decentralised planning, missed investment in R&D to support indigenous energy use pattern at local level and lack of database on end uses at local / regional level for better planning. The drive from National Rural Electricity Policy of 2003 which calls for developing implementable regional or local distributed energy development options and involvement of local institutions, viz., Panchayats are hope for future. This is important where grid connectivity is not possible and areas where population density is low (Mishra 2011). In condition when 88 per cent of rural households in India are dependent on biomass based fuel for daily uses (Reddy 2004), the option of jatropha-based biofuel provides an opportunity to be harnessed for producing more efficient liquid fuel. Field study done by Bhattacharya et al. (2005) in Jharkhand and Odisha shows that there are ample opportunity and uses of biofuel plantation in the rural areas, if proper market and institutional support are provided by the State.

Discussion

Before going further, it is worth discussing the seminal paper of Christopher (1965) in the field of design and city planning. While studying the natural and artificial cities from design perspective he concluded that 'natural cities' are like 'semi-lattice' and 'artificial cities' are more like 'tree'. He said that modern design of cities are more like tree which ignores the social planning and had overlooked the concept of overlapping units by more simpler form of

non-overlapping units. In his opinion this extreme compartmentalisation and the dissociation of internal elements of a unit while planning are the first sign of coming destruction. A biologist can appreciate this concept by comparing the 'tree' with 'food chain' and 'semi-lattice' with 'food web'. Ecologically it is an established fact that food web is more stable and risk absorbing to environmental disturbances than food chain. The case is not very different for planning of natural resource production, processing and utilisation. The proof for this is growing acceptance of organic farming all around the world. Jatropha and Karanje-based biodiesel and its related by-product provides us one such option and opportunity of linking the design of natural resource use with local socio-economic requirement of rural area, added by appropriate technological intervention.

Present status of development of biodiesel in India and other developing countries is showing a unidirectional approach in terms of programme conception and design. This scalar approach is similar to the concept of 'tree', where producers are at one end (in the rural area) and users (urban transport) on the other end. This design presumes that producers are the ones who do not need the output¹¹ (the existing dominant perspective) of the production and it should go to the users at the other ends, irrespective of taking into account the type of resource under consideration and accessible options available to the producers and users. Argument can be forwarded that technically and economically it is not possible to produce and use the biodiesel in pure form and it has to be blended with petroleum diesel. This requires advance technology for processing and mixing, available only with big oil marketing companies. However, studies have shown that jatropha-based biodiesel and other by-products can be produced and used at the local level for local use with low capital input technologies. Sardar Patel Renewable Energy Research Institute (SPRERI, Gujarat) had developed the concept of

holistic approach to utilise all the components of jatropha fruit – shell for combustion, hull / husk for gasification, biodiesel for running combustion engines, cake for production of biogas and spent slurry for manure. It is found that by using holistic approach, the jatropha fruit can give three times more energy against when it is used only for biodiesel (Singh et al, 2008). Study done by group of scientists at Central Salt and Marine Chemicals Research Institute, Gujarat has shown that the products of Jatropha fruit can be used for promoting organic farming by using its oil cake. Shell can be used as coal substitute by changing it into briquettes, in addition to the use of neat biodiesel for running agricultural appliances (Ghose et al, 2007). With the use of lignocellulolytic fungus as inoculum, now it is possible to reduce the phytotoxicity of jatropha hull (by lowering the pH and phenolic content) with four months of gestation period. The resultant organic manure can be used as remedial for acidic soil (Sharma et al, 2009). In addition to this, the opportunity for creating employment in rural area is enormous through jatropha plantation due to involvement of labour-intensive activity which would also have multiplier benefits (Gorge et al, 2005). It is important to recognise that transport fuel use is also linked with other important issues like mobility, lifestyle choice with economic progress, public transport in urban centres, urban land use pattern and international trade. So, the use of biofuel as the only major option to solve the problem of sustainable transport is in itself inadequate and unsustainable. In this context, it is imperative that biofuel programme should not be only hijacked in the name of fulfilling the oil pool deficit and GHG emission reduction by taking away the issue of local resource use design and sustenance in backdrop. In absence of which future will only read that biofuel policy was not diligent enough to [un]learn from the trial and error done earlier in policy implementation.

Notes

1. Used for bioethanol and biodiesel in recent literatures, excluding the biomass based biofuel mostly used in rural areas of developing countries.
2. Accessed from < <http://farm.ewg.org/progdetail.php?fips=00000&progcode=corn>> on 12th December 2012.
3. Accessed from <<http://www.ers.usda.gov/FarmBill/2008/Titles/Title IX Energy.htm#biobased>> on 11th March 2009.
4. Each compact area is a group of districts covering 50,000 to 60,000 hectares of wasteland for Jatropha plantation and establishing forward and backward linkage for biodiesel production and use. The four JFM-based compact areas are in the States of Gujarat, Chhattisgarh, Tamil Nadu and Tripura. The four non-JFM-based compact areas are in the States of Uttar Pradesh, Madhya Pradesh, Maharashtra and Andhra Pradesh (Planning Commission 2003, pp 120-121).
5. In 2010 The Energy and Resources Institute carried out detailed study regarding present status of Jatropha plantation in nine States of India (Andhra Pradesh, Chhattisgarh, Karnataka, Madhya Pradesh, Odisha, Rajasthan, Tamil Nadu, Uttarakhand, and Uttar Pradesh). The executive summary of the report can be accessed from < http://www.teriin.org/index.php?option=com_completed&task=details&pcode=2009CM04 >. Based on the report, Ministry of Rural Development had put on hold the Jatropha plantation programme. Accessed from <<http://dailypioneer.com/nation/66165-jairam-has-no-faith-in-jatropha-biofuel.html>> on 04th December 2012.
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DEVELOPMENT, LAND ACQUISITION AND CHANGING FACETS OF RURAL LIVELIHOODS : A CASE STUDY FROM WEST BENGAL

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ABSTRACT

This paper has been written on the basis of quantitative and qualitative data collected from a needful household survey carried out in four villages of Rajarhat Block, where the Government of West Bengal acquired 6933.72 acres of land under Part-II of Land Acquisition Act, 1894 with the aim of developing a new business centre (IT Hub) and dwelling units in the name of public purposes in recent past. The study, however, finds that acquisition of agricultural land has not only bowdlerised the agriculture based economic activities by dispossessing farmers from their land but also forced them to diversify their livelihood activities. Interestingly, this change in livelihood activities has appeared in the scene with two major characteristics: first, there has been a sudden increase in the share of non-farm workers to total labour force and second, the bulk of this increase in non-farm activities has been mainly casual and inferior in nature. The temporary job opportunities provided by the government to dispossessed households are not inclusive, and unable to absorb majority of the working population of land loser households. Comparatively well-off households with their well tie-up with the local authority and political leaders have achieved greater extent in gaining these opportunities. There has been a substantial change of lifestyle of these native people in rapidly transforming social milieu. The study further identifies that the disparity in terms of estimated per capita monthly consumption expenditure within the project affected households is greater than the farming households unaffected by acquisition.

Introduction

The government of India has always attempted to uphold a commitment to the paradigm of higher industrial growth and accelerated infrastructure development after the end of colonial rule (Bapat, 2009). This commitment has even become stronger in recent years with liberalisation and globalisation of Indian economy which have given birth to an emergence of new growth opportunities. The

neoliberal economy has led many states including West Bengal to compete with each other for pulling in industries and infrastructure developers by providing lucrative incentives. With enormous expansion of the states' role in promoting public welfare and economic development in 1990s, acquisition of land has become far more numerous than ever before. Over the past few decades, vast tracts of agricultural and forest lands have been acquired

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by the various state governments in India in the name of industrialisation, employment generation and infrastructure development under the purview of public purposes. In absence of public scrutiny, such land acquisition has mostly been carried out without the consent of tenants and a large section of land owners. These phenomena result in deprivation of their property rights and make them sacrifice their conventional livelihoods by eliminating their inherited source of livelihoods for the sake of so called larger public interests. Agricultural land holds a special value to farmers and their families (Sau, 2008). It is the prime source of their livelihoods and provides reliable security to the farming families in their hard time. However, acquisition of it has become an engine of oppression (Venkatesan, 2011) and social exclusion (Mahapatra, 1999; De Wet, 2001; World Bank, 2004; Council for Social Development, 2008; Fernandes, 2009 and Sharma, 2010).

In last two decades, the government of West Bengal acquired (or tried to acquire) agricultural land in several places (Rajarhat, Kharagpur, Baruipur, Singur, Nandigram, Bhangor, Uluberia, Dankuni, Puruliya etc.) in the State. Among them Singur and Nandigram are the two places which seemed to have drawn much attention of politicians, social activists, intellectuals, scholars and policy makers due to strong protest raised by the farmers and became the central places of debate in the context of acquisition under the Land Acquisition Act-I of 1894. Several research works (Sarkar, 2007; Banerjee et al, 2007; Banerjee and Roy, 2007; Bhattachariya, 2007; Fernandes, 2007; Mohanty, 2007; Chandra, 2008; Sau, 2008 etc.) had been published on these two places. Most of these papers were conceptual and factual, and did not reflect sufficient primary data. However, a noteworthy instance of land acquisition accomplished by the same government in the name of development remained unnoticed by many. During this period, the place in West Bengal where the largest number of farmers got compelled to change their primary activities

completely due to coercive acquisition of agricultural land by the government is Rajarhat in North 24 Parganas district. Notably, the quantum of land acquired by the government in Rajarhat (6933.72 acres) happened to be about seven times higher than the extent of land acquired for Tata Motors in Singur (997.11 acres). Despite that, Rajarhat did not come to limelight as Singur and Nandigram. Perhaps, one of the prime reasons behind it was that unlike Singur the acquisition of land in Rajarhat on massive scale did not take place at once; rather it was albeit slow and gradual. Therefore, the protest raised by the unwilling farmers could not take place at large scale. Nevertheless, conversion of acquired agricultural land into non-agricultural land with rapid urbanisation has evolved a process of social and economic transformation leading to drastic change in livelihood activities, structures of houses, tendency of using luxury goods and to some extent food habit of the affected farming families of erstwhile agriculture based society. The dispossessed farming families are now passing through a transition phase that comes immediately before rapid urbanisation and industrialisation. Hence, the instance of land acquisition in Rajarhat has been taken up as a case study to bring these changes in light. The aim of this research paper is to examine the change in agrarian status of dispossessed farmers/households in terms of landholding size in post-acquisition stage and to assess the pattern of change in livelihoods of dispossessed farmers caused by the conversion of agricultural land into non-agricultural land. An attempt has also been made to examine the logical consequence of land acquisition and urbanisation on change in structures of houses and use of luxury goods among the dispossessed farming households. Finally, the paper has sought to assess the level of inequality (in terms of per capita consumption expenditure) among the dispossessed households in post-acquisition stage with the farming households unaffected by acquisition and currently engaged in cultivation.

Methodology

The necessary data and information for this study had been gathered from a heedful household level sample survey. The key informant for every sample was the head of the household. The sampling design was chalked out based on the assumption that acquisition of agricultural land and its conversion into non-agricultural land had changed the livelihoods of dispossessed farming households and their economic status in post-acquisition stage. Two sets of sample households had been purposively selected for this study. First set comprised those households which had lost agricultural land due to acquisition and second set included those farming households which were unaffected by acquisition (did not lose any land), currently engaged in agriculture and practising a cropping pattern that resembled the first set before acquisition (control sample). The first set of sample households (dispossessed households) had been drawn from three villages, namely Rekjuani, Gururite and Nawabpur of Rekjuani mouza¹ in Rajarhat where agricultural land had been acquired by the government in recent past and cultivation was almost eradicated. On the other hand, second sets of sample households (control samples) had been drawn from a nearby village named Gobra² in Gobra mouza where land acquisition did not take place. Though households had been randomly³ surveyed for both sets of sample households, a careful attempt was made to draw the samples from every pocket of the above mentioned four villages. In total, 177 households (117 households for the first set and 60 households for the second set) were surveyed. The household survey data gathered from the first set of samples was complemented by a discussion with some important persons associated with the study area, such as Panchayat Proddhan and members, local school teachers and some state government employees including concerned Block Development and Block Land Revenue Officers.

On the basis of mean size of agricultural landholdings in pre-acquisition stage, the first set of sample households has been grouped into large, medium, small and marginal categories. The sample households have also been divided into five categories of economic status (very low, low, medium, high and very high) in terms of per capita monthly consumption expenditure (in rupees) estimated at each sample household. This categorisation has been done with the help of mean (M) and mean deviation (MD) of per capita monthly consumption expenditure of all sample households under first and second set of samples for some selected food items, education, transportation and other necessary stuffs⁴. The ranges or class intervals of high, medium and low economic status categories has successively been taken as {(M+1.5MD) to (M+0.5MD)}, {(M±0.5MD) = (M+0.5MD) to (M-0.5MD)} and {(M-0.5MD) to (M-1.5MD)}. In other words, class interval is 1MD. The very high category has been determined as {above (M+1.5MD)} while very low category as {below (M-1.5MD)}. Gini coefficient simplified by Angus Deaton (1997) has been used to examine the level of inequality in terms of per capita consumption expenditure within the dispossessed households (first set) and households unaffected by acquisition and currently engaged in cultivation (second set) separately. The simplified formula for Gini coefficient is:

$$G = \frac{N+1}{N-1} - \frac{2}{N(N-1)u} \left(\sum_{i=1}^n P_i X_i \right)$$

Where, 'N' is the total number of households and 'u' is the average per capita consumption expenditure among the households. P_i is the per capita consumption expenditure rank 'P' of i^{th} household with 'X' per capita consumption expenditure, such that the household with the highest per capita consumption expenditure receives a rank of 1 and the poorest a rank of n. The value of Gini

coefficient (G) ranges between 0 and 1. Zero corresponds to perfect equality (i.e. every household has same per capita consumption expenditure) and one corresponds to perfect inequality.

Study Area: Rajarhat block in North 24 Parganas district is situated successively in the north-eastern part of Kolkata city and east side of Netaji Subhas Chandra Bose International Airport. According to the Primary Census Abstract (2001), Rajarhat block consisted of population size of 1.45 lakhs, predominantly (95.37 per cent) inhabiting in rural areas. Though urbanisation process started here several years ago, a large rural part of Rajarhat block had been officially transformed from its rural status to urban status in 2010 and now it comes under the jurisdiction of Rajarhat-Gopalpur Municipality. Rural Rajarhat mainly included agricultural land and fishing embankments along with settlements. The government of West Bengal acquired 6933.72 acres of agricultural land and fishing embankment from twenty one mouzas⁵ in Rajarhat block between April 1996 and March 2007 (CAG- Comptroller and Audit General of India, 2007) under Part-II of Land Acquisition Act, 1894 to develop a new business centre (Information Technology Hub) and dwelling units in the form of a planned township. The land was acquired from more than 25000 land owners and 5000 registered tenants. Agriculture was never much developed here. Major portions of acquired agricultural land used to be cultivated by the farmers with two types of paddy, namely aman and boro successively during rainy and summer season. The aman crop was often damaged by flood during rainy season⁶. A section of farmers used to cultivate vegetables, such as potato, cabbage, cauliflower and some leafy vegetables on the higher land adjoining their homesteads in winter season.

Backdrop for Land Acquisition: a Paradigm Shift in Government's Development Policy

West Bengal is indeed a unique State in India. It is the only Indian State that had been

ruled by the Left Front for about three and half decades (June 1977 to April 2011) at a time. From its inception in 1977 through 1980s, this government was truly inspired by a vision of political, economic and social change to reduce the poverty and suppression of the poor and backward class in rural areas. It also initiated the bridging of various divides among different social classes by implementing land reforms and decentralisation of power through three-tier Panchayati System (Banerjee et al, 2002).

Since Independence through 1970s, there was stagnation in agricultural production in West Bengal and it was termed as 'agrarian impasse' by Boyce and several other scholars (Rawal, 2001). The State had a very slow growth rate of agricultural production in 1970s (Saha and Swaminathan, 1994). But interestingly, with sufficient acceleration in implementation of land reforms and active involvement of Panchayati Raj Institution, the previous government of West Bengal transformed the State's status from lagged in 1970s to star performer in 1980s. The loopholes of the West Bengal Land Reforms Act of 1955 were plugged during this period in order to abolish the abuse of landowners' right to take the leased-out land back from sharecroppers on the ground of 'self-cultivation'. Surplus ownerless land was successfully distributed among the landless poor farmers and the rights of sharecroppers were secured through 'Operation Barga' (1978-81) by this government (Bose, 1981; Dasgupta, 1984; Lieten, 1990). Therefore, land reforms provided the poor farmers an incentive to work harder (Sarkar, 2007). All these policies enforced by the government led to the prosperity and growth in rural West Bengal in 1980s. The growth of Net State Domestic Product (at 1993-94 prices) in West Bengal increased from 3.1 per cent per annum in 1970s to 4.7 per cent annum in 1980s and the share of agriculture to total NSDP increased by four per cent during 1980s (Planning Commission: West Bengal Development Report, 2010). However, in 1990s, the growth in agriculture in terms of crop

production (Roy, 2007 and Khasnabis, 2008), NSDP (Planning Commission: West Bengal Development Report, 2010) and employment (Development and Planning Department: West Bengal Human Development Report, 2004) slowed down sharply. Khasnabis (2008) termed this deceleration in agriculture as another 'agrarian impasse'. Low net returns⁷ from major crops in West Bengal were also noticed in 1990s (Roy, 2007). Agriculture became a relatively non-rewarding profession (Gupta, 2005). Although the previous government became able to establish the political stability in 1980s immediately after coming to power in 1977 through decentralisation of power among the rural poor by offering positions in panchayati system, it indeed failed to bring substantial positive growth in large and medium scale industries which witnessed a growth-sluggishness after Independence due to the transfer of ownerships of many large industries from the British to Indian hands, crisis in managerial skills and capital, poor work culture, political will of the government, strong trade union, rising labour militancy in 1960s and 1970s and prevailing license permit raj (Bagchi, 1998; Sen, 2009). In 1980s, West Bengal experienced a significant downsizing in manufacturing employment (Banerjee et al, 2012) along with several other major States in the country; and shockingly West Bengal held the first position among them with a loss of 1,77,000 factory jobs (Parikh & Radhakrishnan, 2002). This incident wreaked an acute unemployment situation in the State (Sen, 2009). The government was looking for an alternative path of development to mitigate this crisis. Meanwhile, the adoption of neoliberal economic policy by the Central government in Delhi provided an immense impetus to the government of West Bengal to bring industrial policy reforms in 1994 that promoted foreign technology and investments and private sector investments in upgradation of industrial infrastructure (Commerce and Industries Department, Government of West Bengal, 2008: p3). The previous government

contended that growth through industrialisation would not only increase labour productivity but also diminish the rearing unemployment and underemployment situation in the State. Hence, in 1990s, the government began a substantial stride toward industrial development and setting up business centres through acquisition of agricultural land in the State. A group of eminent economists (Banerjee, Bardhan, Basu, Dutta Chaudhury, Ghatak, Guha, Majumdar, Mukherjee and Roy, 2007) also argued that with growing population pressure on the limited land and almost stagnant yields in agriculture in the State since 1990s, there was no better alternative than industrialisation.

Portrayal of the Execution of Land Acquisition in Rajarhat

As stated earlier, the acquisition of 6933.72 acres of agricultural land and fishing embankments in Rajarhat had been accomplished under Part-II of Land Acquisition Act, 1894 to develop an IT Hub and dwelling units under the purview of public purpose. The acquisition of land actually went on in different phases over a period twelve years between 1996 and 2007. In 1993-94, the government of West Bengal planned to initiate this development venture⁸. In view of the commencement of land acquisition process in those identified mouzas, in the beginning of 1996 under the Land Registration Act (West Bengal Amendment) 1981, the government imposed restrictions on 'registration of land' which virtually stopped all sorts of private selling and buying of land. Moreover, this restriction kept all real estate agents, housing developers, land mafias and speculators away from these villages until the acquisition was over. To obviate the possibility of speculative appreciation in the market value of land in subsequent years, the available sales proceeds for 1995 was considered as base data for calculation of market rate with annual premium of five per cent for 1996 (CAG, 2007). Although the process was initiated in 1996 with the acquisition of land in Teghoria *mouza*, it

began in Rekjuani *mouza* in 1998 with the publication of preliminary notifications under section 4(1) of the LAA and completed in 2003. Acquisition was first started in village Nawabpur, followed by Gururite and Rekjuani. The notices to the persons interested (i.e. owners and registered tenants) in notified lands were issued by the collector under sub-section 1 and 2 of section 9. The respondents of sample households informed that the collector paid only rupees 3.60 lakh per acre of land as total compensation in 1998 irrespective of its type and quality, whereas in 2003 the total compensation per acre of land was increased to rupees 7.80 lakh. The collector paid twenty five per cent of it to registered tenants separately. The collector even acquired the notified land from those owners who did not accept the compensation award by giving their consent in writing to him after the date of declaration of award under section 11(1). In such cases, he deposited the amounts of compensation awards to the court under section 31(2) of the LAA. During the course of interaction with the dispossessed farmers, a few of them who went through these experiences bemoaned that the retrieval of compensation award from the court was an extremely difficult and painful task. These farmers were not assisted by the officers of the land acquisition cell; rather they were harassed by them in every step of the legal proceedings. However, the difficulties in retrieval of compensation award from the court made many farmers frightened in successive phases of acquisition and they gave up their land in despair. In several meetings with local people, the then minister of Housing and Public Health Engineering of West Bengal and several politicians from ruling party promised an assured job for at least a member of each dispossessed household in upcoming industries on acquired land. Some years already went by but no one from the sample households got permanent job in Rajarhat Newtown. Only the construction of multi-storied apartments, corporate offices, IT parks, hospitals etc., is going on. And it is for sure that corporate bodies and IT giants would not

absorb the local dispossessed farmers for higher profile jobs.

Acquisition of Agricultural Land and Change in Agrarian Status of Farmers

Size of landholdings among the sample households has been considered as an important indicator to determine the agrarian status of farmers/farming households. However, the standard categorisation⁹ of sample households into large, medium, small and marginal farming households in terms of landholdings size would not be desirable in present study area and perhaps in any other part of West Bengal. This is because of two reasons: first, there is a very little proportion of farmers with more than 4 hectares (4 hectares = 9.884 acres) of cultivable land in the study areas due to rigorous implementation of land reforms and redistribution of ownerless land among the landless poor in end of 1970s and in 1980s by the previous government; second, gradually increasing population density in the State and division of joint family into nucleated family in rural areas have even led the farms to be fragmented; consequently the landholding size at household level has been steadily declining since the Independence (Basole and Basu, 2011). Therefore, for the present study, agrarian status of farmers/farming households has been determined by considering the mean size of landholdings of the sample households at pre-acquisition stage and all the sample households have been grouped into four categories: large (more than 2.65 acres), medium (1.65 to 2.65 acres), small (0.65 to 1.65 acres) and marginal (less than 0.65 acre) farmers/farming household.

Acquisition of agricultural land has significantly brought a downward change in agrarian status of affected farming households in terms of size of landholdings in Rekjuani, Gururite and Nawabpur in post-acquisition stage. Though there was not even a single sample household without cultivable land in pre-acquisition stage, more than eighty per cent of

the sample households have become agricultural landless in post-acquisition stage (Table 1). The obtrusive fact is that not even a single sample household has claimed the status of large or medium category in these villages of Rajarhat in post-acquisition stage. The average size of landholdings at household level has sharply reduced from 1.95 acres in pre-acquisition stage to 0.06 acre in post-acquisition

stage (Table 2). This sudden change in agrarian status caused by the government interference has become a matter of great worry among a section of farmers in the locality. The active involvement of the government for acquiring agricultural land has been identified as a reverse process of its land reforms and land redistribution measures in late 1970s and early 1980s by the farmers in West Bengal (Banerjee and Roy, 2007).

Table 1 : Change in Agrarian Status of Farming Households Due to Acquisition

Study Area	Status of Farming Households (Category)	Before Acquisition		After Acquisition	
		No. of Households	% to Total	No. of Households	% to Total
Rekjuani, Gururite and Nawabpur: Rajarhat	Large (More than 2.65 acres)	22	18.80	0	0.00
	Medium (1.65 – 2.65 acres)	31	26.50	0	0.00
	Small (0.65 – 1.65 acres)	52	44.44	4	3.42
	Marginal (Less than 0.65 acre)	12	10.26	18	15.38
	Households without any cultivable land	-	-	95	81.20
Total Sample Households		117	100.00	117	100.00

Data source: Household survey, 2009.

Table 2 : Distribution of Cultivable Land and Change in Mean Size of Landholdings at Household in Rekjuani, Gururite and Nawabpur

Status of Farmers (Category)	Agricultural Land After Acquisition			Agricultural Land Before Acquisition				
	Total land (Acre)	% to Total land	Mean size of land holdings at household level (Acre)	Land acquired (Acre)	Land acquired (% to total land)	Land remained (Acre)	% to Total land	Mean size of land holdings at household level (Acre)
Large Farmers (More than 2.65 acres)	103.00	45.17		101.17	44.37	1.83	0.80	
Medium Farmers (1.65 – 2.65 acres)	64.93	28.47		62.12	27.24	2.81	1.23	
Small Farmers (0.65 – 1.65 acres)	55.04	24.14	1.95	52.81	23.16	2.23	0.98	0.06
Marginal Farmers (Less than 0.65 acre)	5.05	2.21		4.92	2.15	0.17	0.07	
Total	228.02	100.00		221.02	96.91	7.04	3.09	

Data source: Household survey, 2009.

Pattern of Livelihoods Before Acquisition

Agricultural land is a valuable natural resource that plays a key role to shape up the pattern of rural livelihoods in West Bengal. Unlike Singur, though agriculture was not very developed in Rekjuani, Gururite and Nawabpur of Rajarhat due to low lying nature of the major portion of their vast agricultural field, the working population of dispossessed households of these villages was predominantly engaged in

agriculture based livelihood activities before acquisition (Table 3). Noticeably, in spite of being closely located to Kolkata metropolitan city and Netaji Subhas Chandra Bose International Airport, a meagre proportion of working population of the sample households was engaged in non-agricultural activities. The lack of technical skills and lower level of education among majority of these working people seemed to be responsible factors for it (Table 4).

Table 3 : Change in Livelihoods of Working Population of Land Loser Households in Rekjuani, Gururite and Nawabpur

Livelihood activities	Occupation Before Acquisition		Occupation After Acquisition	
	Count	Per cent	Count	Per cent
Cultivators	233	88.59	1	0.38
Agricultural labour	1	0.38	3	1.14
Non-agricultural workers and waged non-agricultural labour, maid servants	2	0.76	62	23.57
Dairy and fishing	-	-	6	2.28
Carpenters, painters and masons	2	0.76	30	11.41
Syndicate business	-	-	19	7.22
Divers, rickshaw drivers and conductors	-	-	13	4.94
Business (other than syndicate)	2	0.76	49	18.63
Brokers	-	-	2	0.76
Security guards	-	-	5	1.90
Government / private company employees	11	4.18	10	3.80
Teachers	4	1.52	3	1.14
Electricians and mechanics	2	0.76	2	0.76
Others (<i>Anganwadi</i> helper* , private tutors, tailors etc.)	6	2.28	12	4.56
Jobless	-	-	46	17.49
Total Workers	263	100.00	263	100.00

Data source: Household survey, 2009.

Note : Here those workers have been considered whose age was above 15 years and below 60 years at time of acquisition and who were engaged in economic activities.

* '*Anganwadi* helper' or '*Sahayika*' is one of the main actors of Integrated Child Development Services (ICDS). The Government of India launched the ICDS programme on 2 October 1975. This programme seeks to provide a package of 'integrated services' (supplementary nutrition, growth monitoring and promotion, nutrition and health education, immunisation, health services, referral services and non-formal pre-school education) keeping the focus on children under six. ICDS services are provided through a vast network of its centres known as '*anganwadi*' or '*anganwadi* centre'. An *anganwadi* is a village courtyard where the above mentioned services are being delivered. The main duties of *anganwadi* helper are: bringing children to the *anganwadi*, cooking and serving food for them, fetching water for *anganwadi* and cleaning the *anganwadi* premises daily.

Table 4 : Level of Education Among the Working Population of Dispossessed Sample Farming Households in Rekjuani, Gururite and Nawabpur

Level of Education	Count (working population)	Per cent
Illiterate	21	7.98
Class I to IV	14	55.89
Class V to IX	74	17.87
Class X to XII	74	16.35
Graduation and Above	35	1.90
Total	263	100.00

Data source: Household survey, 2009.

Note: Here those workers have been considered whose age was above 15 years and below 60 years at time of acquisition and who were engaged in economic activities.

Pattern of Livelihoods After Acquisition

Even after the completion of land acquisition in Rekjuani, Gururite and Nawabpur, some land loser households could cultivate crops on acquired land for few years because entire acquired land was not used by the government for urbanisation and infrastructure development at a time. The filling of low lying land with infertile soils and subsequent urban development through construction of roads, buildings etc., started progressing from the south toward north and cultivation was stopped on acquired land in these villages at the end of 2007. As a result of that, livelihood of the working population of dispossessed farming households in Rekjuani, Gururite and Nawabpur underwent a tremendous transformation within few years. The eradication of cultivation, conversion of agricultural land into non-agricultural land and rapid urbanisation compelled and led majority of unskilled working population of the dispossessed sample households towards diversified non-farm economic activities that included security guard, taxi driver, mason, carpenter, rickshaw and trolley puller, construction labour, domestic servant and both petty and flourished businessmen¹⁰ (Table 3). A

few working population of land loser households turned into real estate brokers and contractors who are now making good amount of money working as middlemen between the land/flat/house sellers and the buyers by fixing the deal at 2 to 3 per cent commission on sales agreements from both the parties¹¹. Rapid urbanisation in Rajarhat at large scale has developed a new and unique source of employment. Since massive construction works for buildings and infrastructure development are being carried out in Rajarhat Township, there is a huge demand of raw materials like sand, bricks, iron rods, cement and other necessary materials. To supply these materials a number of cooperatives with 10 to 20 members or more from land loser households have been formed in consent of concerned village panchayat. These cooperatives are locally known as 'syndicates'. Most of the members of a syndicate are comparatively from better-off land loser households and are having very good connection with the local authority and politicians. Though a single person is not entitled to be the sole owner of a syndicate, there is no fixed share for a member in it. Therefore, a large proportion of the capital invested in a syndicate is primarily

contributed by the better-off land loser households. And the profit earned by a syndicate is distributed among the members according to their share to the total. Though the syndicates are temporary in nature, they have emerged as important sources of income among the dispossessed households in post-acquisition stage. A considerable proportion (17.49 per cent) of working population from the sample households in Rekjuani, Gururite and Nawabpur has become jobless in post-acquisition stage. This group of working population is of two categories. First category includes those jobless workers who belong to the lower end of working age limit and are from comparatively well-off dispossessed households. Majority of them are literate but not well skilled and well educated. They are pretty ambitious for their work and conscious about the status of menial jobs, such as construction labour, domestic servant etc. Second category includes unskilled jobless workers with comparatively lower physical strength and they have reached the upper end of working age limit. Majority of them are either

illiterate or with very low level of education. Therefore, it has become a very difficult task for them to find optimal non-farm livelihood activities in rapidly changing economic milieu in post-acquisition stage.

Diversification in Sources of Household Income

Acquisition of agricultural land and conversion of it into non-agricultural land has not only changed the pattern of livelihood of the dispossessed households but also diversified the sources of household income (Table 5). More than three-fourths of the total sample households earned their livelihood solely from cultivation before acquisition but none of them are entirely dependent on cultivation for their livelihood in post-acquisition stage. Although 56 per cent of the total sample households still generate their household income from a single source, it would be worthy to mention that none of them has reported cultivation as the source of household income. The proportion of sample households having more than one source of

Table 5 : Sources of Household Income in Pre and Post-acquisition Stage

Sources of Household Income	Rekjuani, Gururite and Nawabpur			
	Before Acquisition		After Acquisition	
	No. of Households	% to Total	No. of Households	% to Total
Single source, cultivation is only source of income	90	76.92	-	-
Double sources, cultivation is one of them	19	16.24	3	2.56
Triple sources or multi-sources and cultivation is one of them	8	6.84	-	-
Single source but not cultivation	-	-	66	56.41
Double sources but cultivation is none of them	-	-	30	25.64
Triple sources or multi-sources but cultivation is none of them	-	-	15	12.82
No source of income or jobless	-	-	3	2.56
Total	117	100.00	117	100.00

Data source: Household survey, 2009.

income has also increased substantially in post-acquisition stage.

Land Acquisition and the Changing Lifestyle

'Lifestyle' can simply be defined as the way of living of individuals, families or/and societies, which they manifest in coping with their physical, psychological, social and economic environment on day-to-day basis. Like the other rural part of West Bengal, most of the villagers in Rajarhat had typical agrarian and traditional life style until the completion of land acquisition. However, rapid urbanisation on acquired agricultural land and penetration of Kolkata metropolitan city culture has been changing that traditional lifestyle of dispossessed farmers and their family members in Rekjuani, Gururite and Nawabpur of Rajarhat since several years. In pre-acquisition stage majority of the sample households lived in katcha houses with walls made of mud or bamboo and covered by a roof made of thatch or tin or fired clay tiles, whereas a reversed scenario has been noticed among them in post-acquisition stage (Table 6). About 61 per cent dispossessed households (families) are now living in pucca houses (buildings) and most of which they have made recently with the compensation money collected from the government in lieu of their land. During field survey it was noticed that some small dispossessed farming households started constructing concrete houses in places of old katcha structures but they could not complete it even after spending the entire amount of compensation money. This could perhaps happen due to inefficiency of these erstwhile agriculturists in estimating the quantity and cost of construction materials. The tendency of using luxury goods like car, washing machine, refrigerator and especially motorbike among the land loser households has considerably increased after acquisition (Table 6). During the course of field survey, a large farmer of Nawabpur informed that there were only two motor bikes in his village before acquisition but after

acquisition the count became more than a hundred and many land loser households bought more than one bike in their families. Cultivable land acquisition and subsequent rapid urbanisation have also changed the food habits of the villagers to some extent. Earlier the members of the dispossessed farming households used to have rice in both lunch and dinner as the main food. However, in the absence of cultivation in post-acquisition stage, wheat flour has replaced rice as the main food in dinner among many land loser households. Many households have sold off their cows, bulls, goats and sheep due to lack of fodder.

The change in lifestyle has become more prominent among those land loser sample households which had some amount of land in their possession after the completion of acquisition. In post-acquisition stage, majority (63.64 per cent) of these sample households have sold their remaining cultivable land completely to speculators and realtors at much higher price (between rupees 90 lakh to 1.5 crore per acre¹²) than the price offered by the government. With a part of this money some households have bought cars and taxis. Now in weekend the young male population of these households often hang out in world class luxury malls which have come up on the acquired land in Rajarhat. On the other hand, a proportion of better-off dispossessed households have kept their entire remaining land intact to make 'better deals' in future (Table 7). The sharp boom in land price in Rekjuani, Gururite and Nawabpur is primarily the outcome of increasing demand of land by different users with varying motives. IT giants like International Business Machines Corporation (IBM), Genpact, Tech Mahindra, Hisdustan Computers Limited (HCL), Tata Consultancy Services (TCS), Infosys etc., are now on the acquired land. Multi-storeyed apartments with swimming pools, parks and community halls, shopping malls, educational institutes, hospitals, luxury hotels etc., are also coming up here. These entire phenomena make a point evident that

land acquisition and rapid urbanisation at large scale have evolved a process of social and economic transformation in Rekjuani, Gururite and Nawabpur in Rajarhat. Rapid development, on the other hand, has become a nightmare, threat and matter of great worry to many

dispossessed small and marginal farmers to live in as the land brokers and land mafias are directly approaching them for their homesteads now. Therefore, in given changing socio-economic scenario in Rajarhat, it would not be surprising if a part of dispossessed marginal farmers goes away from their native place by selling their

Table 6 : Nature of the Houses and Luxury Goods Used by the Households Before and After Acquisition in Rekjuani, Gururite and Nawabpur in Rajarhat

Component	Nature of house	Before Acquisition		After Acquisition	
		No. of households	Per cent	No. of households	Per cent
House	Katcha	79	67.53	7	5.98
	Semi-pucca	26	22.22	24	20.51
	Pucca	9	7.69	71	60.68
	Mixed	3	2.56	2	1.71
	Pucca under construction	-	-	13	11.11
	Total sample households	117	100.00	117	100.00
Luxury goods	Car/taxi	1	0.85	7	5.98
	Motorbike	11	9.40	71	60.68
	Washing machine	2	1.71	14	11.97
	Refrigerator	17	14.53	37	31.62
	Computer	-	-	6	5.13

Data source: Household survey, 2009.

Table 7 : Nature of the Selling of Remaining Land by Sample Households in Post-acquisition Stage in Rekjuani, Gururite and Nawabpur

Nature of selling in post-acquisition stage	No. of Households	% to total households owned agricultural land in post-acquisition stage
Sold remaining agricultural land completely	14	63.64
Sold remaining agricultural land partially	4	18.18
Held entire remaining agricultural land intact	4	18.18
Total sample households that owned some agricultural land in post-acquisition stage	22	100.00

Data source: Household survey, 2009.

homesteads off to interior rural areas in near future to be the survival of the fittest.

Economic Status of Dispossessed Farming Households and Households Unaffected by Acquisition and Engaged in Agriculture

It is true that 'per capita income' is considered as the most important indicator for measuring economic status of a family or society across the world. However, getting actual data regarding total or per capita income generated by farming households in rural areas in India is very difficult. Hence, per capita consumption expenditure (in rupees) at household level (for some selected essential food items, education, transportation and other necessary stuffs) had been selected as a potential alternative indicator for measuring the same. Per capita consumption expenditure was calculated for last thirty days from the day of survey in a sample household. The quantity of each and every food and other items consumed/used by a household for the above mentioned period was multiplied by the per unit local market price prevailing at the time of survey (rupees per kg or rupees per piece). Thus, total monthly (last thirty days from the day of survey in a household) consumption expenditure (in rupees) per sample household as well as per capita monthly consumption expenditure at household level was estimated. It was found that while more than one-fourth of the dispossessed sample households (first set of samples) came under higher categories (high and very high) of economic status, only a meagre

proportion (3.33 per cent) of farming households unaffected by acquisition (second set of sample) belonged to high category (Table 8). However, majority of households from both sets of samples belonged to the categories of low and moderate economic status. Interestingly, no one from farming households unaffected by acquisition reported its economic status as very low, as it has been evidenced by a tiny proportion (1.71 per cent) of dispossessed households. This tiny proportion of dispossessed households happened to be in the category of very low economic status due to the incapability of some small and marginal farming households to establish their foothold in rapidly changing socio-economic environment with scanty financial and physical capitals or to find suitable jobs in post-acquisition stage for their unskilled family members with very low level of education. The degree of inequality had also been estimated within the dispossessed households (first set of samples) and farming households unaffected by acquisition and currently engaged in cultivation (second set of samples) with the help of simplified Gini coefficient (Table 9). It substantiated that the extent of inequality in terms of per capita consumption expenditure within the dispossessed sample households was higher (Gini ratio 0.27) than that of households currently engaged in cultivation (Gini ratio 0.12). This could be possible perhaps because of the diversification in livelihood activities of the working population of dispossessed households in post-acquisition stage.

Table 8 : Economic Status (in terms of per capita consumption expenditure) of Dispossessed Households and Farming Households Unaffected by Land Acquisition

Category	Monthly per capita consumption expenditure at household (in Rupees)	Dispossessed Households (Sample set-1)		Farming households unaffected by acquisition (Sample set-2)	
		Count	Per cent	Count	Per cent
Very high	Above 1125	14	11.97	-	-
High	1125 - 815	17	14.53	2	3.33
Medium	815 - 505	41	35.04	35	58.33
Low	505 - 195	43	36.75	23	38.33
Very low	Below 195	1	1.71	-	-
Total Samples		117	100.00	60	100.00

Data source: Household survey, 2009.

Note: Mean of the monthly per capita consumption expenditure of all households (sample set 1 & 2) is 662.12 rupees (approximated 660 rupees) and Mean Deviation is 312.49 rupees (approximated 310 rupees). See Table 1A in appendix.

Table 9 : Gini Coefficient of Dispossessed Households and Farming Households Unaffected by Acquisition

Sample households	Dispossessed households from land (Sample set-1)	Households engaged in cultivation and unaffected by acquisition (Sample set-2)
Gini coefficient	0.27	0.12

Data source: Household survey, 2009.

Conclusion

It is clear from the foregoing discussion that acquisition of agricultural land has turned into a crucial factor for downward change in agrarian status of affected farming households in terms landholding size in Rajarhat. The mean size of landholdings at household had reduced sharply from 1.95 acres in pre-acquisition stage to 0.06 acres in post-acquisition stage. With low level of education and technical skills majority (about 90 per cent) of the working population

of dispossessed sample households in Rajarhat were engaged in agriculture based livelihood activities before acquisition. However, in post-acquisition stage 17.49 per cent of total working population became jobless. The eradication of cultivation through conversion of agricultural land into non-agricultural land has compelled and led majority of the remaining working population of dispossessed sample households towards diversified non-farm economic activities that include security guard, taxi driver, mason,

carpenter, rickshaw and trolley puller, construction labour, domestic servant and both petty and flourished businessmen. The construction work for urbanisation and infrastructure development in rural Rajarhat at large scale has developed a new and unique source of employment in the form of cooperatives locally known as syndicates. Though the syndicates are temporary in nature, they have emerged as important sources of

income among a section of dispossessed households in post-acquisition stage. Acquisition of agricultural land and its conversion into non-agricultural land has not only changed the pattern of livelihood of dispossessed households but also diversified the sources of household income in post-acquisition stage and evolved a process leading to social and economic transformation in erstwhile agriculture based society in Rejjuani, Gururite and Nawabpur of Rajarhat in West Bengal.

Notes

1. 'Mouza' refers to a revenue collection unit in a district. A *mouza* consists of one or more settlements or villages in a particular area.
2. Village Gobra comes under the jurisdiction of Gobra Gram Panchayat. Since all villages under the jurisdiction of Rajarhat-Bishnupur No. 1 Panchayat were affected by the acquisition and consequently cultivation was almost uprooted, none of them was chosen for drawing control samples. Therefore, nearby village Gobra had been selected for drawing control samples on the basis of the testimonials about the cropping pattern given by the Panchayat *Proadhan* (Head) of Rajarhat-Bishnupur No. 1 Gram Panchayat as well as many land loser farmers of Rejjuani, Gururite and Nawabpur who were well aware of the cropping pattern practised by the farmers in Gobra village.
3. The sample households were randomly drawn because of two reasons. First, the list of land loser households could not be collected from the concerned offices (panchayat office, block development officer's office, block land revenue office, district land acquisition cell or West Bengal Housing Infrastructure Development Corporation Limited Office). Second, not every dispossessed farmer was ready to provide necessary information about land acquisition. Many dispossessed farmers were very much suspicious about the political affiliation of strangers (whether the stranger belongs to then ruling Communist Party or the opposition Trinamool Congress Party).
4. The foods, other consumable items, education and transport expenses which were selected for the estimation of consumption expenditure at household level are: (i) cereals- rice, wheat, suji/sewai, bread, muri, and other rice product; (ii) pulses- arhar, moong, masur, soyabean and besan; (iii) milk and milk products- milk, milk powder, curd and butter; (iv) egg, fish and meat; (v) vegetables- potato, onion, carrot, pumpkin, papaya, cauliflower, cabbage, leafy vegetables, tomato, capsicum, lemon, garlic and ginger; (vi) fruits- banana, coconut, guava, orange fruits, litchi, apple, grapes & other citrus; (vii) education- books, Journals, newspaper, stationery, tuition and institution fees; (viii) telephone/mobile, transport and domestic servants (ix) others- sugar, salt, chillies, tea and coffee, cold beverages, smoking, kerosene and dung cake, LPG and coal.
5. Twenty one *mouzas* are : Rejjuani, Raigachi, Jatragachi, Tarulia, Chakpachuria, Patharghata, Gopalpur, Hatiwara, Aatghora, Koikhali, Teghoria, Noaparaha, Dashdron, Mahishgoth, Sulanguri, Mahishbathan, Ghuni, Baaligorhi, Chowk-pachulia, Thakdari and Kadampur.

6. The agricultural land of these three villages laid in a vast field called 'Dhupir Bil'. Due to lower location, it was often flooded during rainy season.
7. Net return or net income had been defined by the author as the surplus of gross value of output over paid out cost only. With the inclusion of the cost of family labour, the net return would be extremely low or might go negative for some crops.
8. Rajarhat Township was planned to make a major hub for business, trade, IT parks, institutions and culture. Another aim of it was to provide sufficient land for the construction of dwelling units for all income groups, with particular emphasis on the low and middle income segments. However, it has now become the main attraction for wealthy families. Getting house or flat in this area has become entirely beyond the reach of low income group.
9. The standard categorisation includes large farm (more than 4 hectares or 9.884 acres), medium farm (2 to 4 hectares or 4.942 to 9.884 acres), small farm (1 to 2 hectares or 2.471 to 4.942 acres) and marginal farm (less than 1 hectare or 2.471 acres).
10. Petty businesses included vegetable seller, hawker, plastic bottle seller, green coconut seller, and tea and cigarette seller at open space; whereas flourished business included property dealer, garment shops, taxi service and grocery store in Rajarhat market.
11. Broker may fix the deal in two ways. First, broker can bargain for his commission with both sellers and buyers. The price of the property will be determined by the seller only. Broker will find the buyer. Accordingly, sales agreement will be made between seller and buyer and the broker will earn his commission on the total value of the sales agreement from both parties. Second, broker himself first fixes the selling price with the seller and looks for the buyer. But the broker will always keep higher price before the buyer than the price desired by the owner and the excess amount over the price demanded by the owner (seller) will go to the broker's pocket and buyer will be ignorant about it.
12. Information on sales agreement had been obtained from those sample households which sold their land in post-acquisition stage.

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Appendix

Table 1A : Categorisation of the Sample Households

Category	Formula	Range of Values
Very High	Above (Mean + 1.50 MD)	Above 1125
High	(Mean + 1.50 MD) to (Mean + 0.50 MD)	1125 to 815
Moderate	(Mean ± 0.50 MD) = (M + 0.50 MD) to (M - 0.50 MD)	815 to 505
Low	(Mean - 0.50 MD) to (Mean - 1.50 MD)	505 to 195
Very Low	Less than (Mean - 1.50 MD)	Below 195

FINANCIAL PERFORMANCE OF RRBs IN SAURASHTRA REGION OF GUJARAT

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ABSTRACT

Agricultural sector plays a dominant role in improving living standard of people and employment generation in rural India. Regional Rural Banks are providing credit to farmers, agricultural labour and artisans for the development of rural India. So it is essential to evaluate its performance and viability regarding agricultural sector to enhance the smooth flow of credit to this sector. Keeping this in view, an attempt was made to undertake the study on "economic evaluation of the performance of institutional finance to agriculture in Junagadh district, Gujarat".

The results of performance and viability through various ratios indicated a considerable improvement and sound position of credit delivery system of the bank. Current ratio and quick ratio for Junagadh Amreli Gramin Bank (JAGB) were found, on average, 1.53 and 1.25, respectively while the gross profit ratio was found 3.87. The turnover ratio and net capital ratio indicated sound performance and long-term financial safety over a period of time. Working capital ratio and capital employed turnover ratio were found 4.57:1 and 6.68:1, and 4.50:1 and 6.63:1 for JAGB and SGB, respectively, while the net capital ratio was found more than unity during study period. Economic performance ratio and operational performance ratio showed expected performance and improvement in size and volume of business. Productivity per staff and per branch increased from ₹10.40 lakh to ₹287.66 lakh and from ₹36.02 lakh to ₹969.59 lakh respectively, during the study period.

Introduction

Agriculture is the basic growth engine of Indian economy. Agriculture accounts for nearly 18 per cent of Gross Domestic Product and provides employment to around 65 per cent of the rural workforce. Though agriculture is the backbone of Indian economy, today, it is one of the slowest growing sectors of our economy with growth rate ranging between 2 to 3 per cent. This has led to a decline in overall growth of the economy. As compared to industrial and

service sectors, agricultural sector has not only shown low but also an inconsistent growth.

For achieving the desired growth, and to improve the standard of living, modern technology has become essential. It has now become capital intensive by attracting huge amount of capital for investment. A large number of agencies, including cooperatives, regional rural banks (RRBs), commercial banks, non-banking financial institutions, self-help groups (SHGs) and a well-spread informal credit outlet

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together constitute the Indian rural credit delivery system. Provision of adequate, timely, and liberal credit to the farmers has become an integral part of the agricultural development policy in India. Thus, there is large scope for institutional agencies to expand the credit base of farm sector further. Keeping this in mind, in 2004, Government of India, announced the target of doubling the farm credit in three years. During these three years, as an association of the regional rural banks, the cooperative banks and the scheduled commercial banks, in close coordination with National Bank for Agriculture and Rural Development (NABARD) have disbursed credit to the farm sector and the target has been achieved even before time.

Gujarat State has 53 Commercial Banks (26 private sector banks), 3 RRBs, 1 State Cooperative Bank, 18 District Central Cooperative Banks (DCCBs), and one State Cooperative Agriculture and Rural Development Bank (SCARDB). The total deposit, total outstanding and outstanding of agricultural sector of Saurashtra Gramin Bank during 2007-08 were ₹ 841.55, ₹ 544.96 and ₹ 448.25 crore, respectively, with 64.76 per cent credit deposit ratio. The loan disbursed to farm sector was ₹ 385.52 crore during 2007-08, which was 88.11 per cent of total loan disbursed. In this backdrop, it is essential to evaluate the financial performance and viability of RRBs in Saurashtra region of Gujarat. The specific objectives of the study are;

- (1) To examine the performance of flow of institutional finance to agriculture sector.
- (2) To study the financial performance and viability of selected banks.

Methodology

Regional Rural Banks (RRBs) are India's state-owned development finance vehicle charged with serving the rural people. In Gujarat, after merger in February 2006, three RRBs have

been functioning with a wide network of 425 branches. As Saurashtra Gramin Bank (SGB) has a wide network of branches in Junagadh district, SGB was purposively selected for the study. Data were collected from the records of the Saurashtra/Junagadh-Amreli Gramin Bank for the period from 1992-93 to 2007-2008.

Concepts and Estimation Procedure

Loan : It refers to the quantum of fresh credit disbursed during that specific year.

Term Loan/Agricultural Credit : This refers to both medium and long-term investment credit made available per hectare of gross cropped area.

Total Income (₹) : This is calculated from the sum of the earnings by all the members in the household from all sources.

Liquidity Ratio : It is extremely essential for a bank to be able to meet its obligation as they become due. Liquidity Ratio measures the ability of the bank to meet its immediate obligation since lack of sufficient liquidity will result in bad credit rating, loss of creditor's confidence etc. A very high degree of liquidity will result in idle assets. There should be proper balance between liquidity and use of assets.

(i) Current Ratio : Current Ratio is calculated by dividing current assets with current liabilities. Current assets include cash and those assets which can be converted into cash within a year. All obligations which are maturing within a year are included in current liabilities. A relatively high value of the current ratio is considered as an indication that the bank is liquid and has the ability to pay dues. As a conventional rule, a current ratio of 2:1 or more is considered satisfactory.

$$\text{Current Ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

(ii) Quick Ratio or Acid Test Ratio : Quick ratio or acid test ratio is a more refined measure of bank liquidity as this ratio measures the relationship

between Quick assets and Quick liabilities. Generally a Quick Ratio of 1:1 is considered to represent a satisfactory current financial condition.

$$\text{Quick Ratio or Acid Test Ratio} = \frac{\text{Quick assets}}{\text{Quick liabilities}}$$

Profitability Ratio and Return on Investment Ratio:

The performance of the bank in relation to its profitability and turnover is reflected by this ratio. The better profitability position can be said to have been contributed more by operational efficiency than by economic efficiency reflected in business growth.

(1) Gross Profit Ratio

Gross profit = Gross profit as per profit and loss account
Sale = Sales net of returns

It indicates basic profitability, efficiency and margin of safety. Higher the value, greater is efficiency.

$$\text{Gross profit ratio} = \frac{\text{Gross profit}}{\text{Sales}} \times 100$$

(2) Net Profit Ratio

$$\text{Net profit ratio} = \frac{\text{Net profit}}{\text{Turnover}} \times 100$$

(3) Operating Profit Ratio

Operating profit = Sales less cost of sale

Sale = Sales net of returns

It indicates operating performance or efficiency of business.

$$\text{Operating profit ratio} = \frac{\text{Operating profit}}{\text{Sales}} \times 100$$

(4) Return on Assets

Net profit after taxes is the ratio of earning after taxes to average total assets (Tangible assets or fixed assets).

It indicates net income per rupee of average fixed assets. Higher the ratio, the better is the utilisation of assets.

$$\text{Return on assets} = \frac{\text{Net profit after taxes}}{\text{Average total assets}} \times 100$$

(5) Returns on capital employed (ROCE)

Total Earnings = earning after taxes + interest on debt funds + non-operating adjustment.

Capital Employed = fixed assets + net working capital.

It indicates overall profitability of the business on the total funds employed, and also indicates how management has used the fund supplied by the creditors and owners. Higher the ratio, the more efficient is the bank using fund entrusted to it. If ROCE is greater than interest rate, the use of debt fund is justified.

$$\text{Return on capital employed} = \frac{\text{Total Earnings}}{\text{Capital Employed}}$$

Economic Performance Ratio

(1) Burden Efficiency Ratio: This ratio indicates the degree of effectiveness of resources, and the burden of operating expenses on business. So, lower ratio indicates good performance of the bank.

$$\text{Burden Efficiency Ratio} = \frac{\text{Burden Business}}{\text{(source + uses)}}$$

Burden = Operating Expenses - Other income
Business = Deposit + Borrowing

(2) Business Growth Ratio

$$\text{Business growth ratio} = \frac{\text{Current period business}}{\text{Previous period business}}$$

(3) Operating Expenses Growth Ratio

$$\text{Operating expenses ratio} = \frac{\text{All operating expenses}}{\text{Sales}}$$

It indicates a relationship between expenses to sales. A lower ratio indicates better management of fund.

(4) Efficiency Ratio: This ratio indicates the cost incurred to earn one rupee of income so lower ratio indicates efficient performance of the bank.

$$\text{Efficiency Ratio} = \frac{\text{Total cost}}{\text{Total income}}$$

Operational Performance Ratio

(1) Productivity Per Staff/Branch: Productivity per staff especially with more increase in advances per account helps bank to improve the recovery percentage and to come out of losses to earn profits overtime. Productivity per staff is one of the physical performance indicators. This is closely associated with other financial performance indicators, viz. percentage of overdues to demand, fixed assets and proportion of time deposits to total deposits. The resource position and effective utilisation greatly influence the working efficiency of the bank. Thus, in order to achieve faster growth in physical and financial resources, there is need to maintain the tempo of resources mobilisation for investment purposes.

$$\text{Productivity per staff} = \frac{\text{Volume of business}}{\text{Total bank staff}}$$

$$\text{Productivity per branch} = \frac{\text{Volume of business}}{\text{Total bank branch}}$$

(2) Uses to Sources Ratio: This ratio indicates fund development with the help of present sources.

$$\text{Uses to sources ratio} = \frac{\text{Uses}}{\text{Sources}}$$

Uses = Advance + Cash

Sources = Deposit + Borrowing

(3) Non-performing advances: This ratio indicates increase in non-performing assets per every unit increase in advances, lower the ratio indicate good operational performance.

$$\text{Non-performing advances} = \frac{\text{Non-performing assets}}{\text{Advances}}$$

Turnover/Active and Solvency Ratio

(1) Working Capital Turnover Ratio: This ratio indicates the efficiency of the bank in utilising the working capital in business. A higher ratio denotes more efficient use of working capital in the business. It signifies the ability to generate sales per rupee of working capital.

$$\text{Working capital turnover ratio} = \frac{\text{Turnover}}{\text{Net working capital}}$$

(2) Capital Employed Turnover Ratio: Capital employed may be defined as non-current liabilities plus owner's equity or permanent capital or long-term fund. The ratio indicates the ability of bank in generating sales per rupee of long-term investment.

$$\text{Capital employed turnover ratio} = \frac{\text{Turnover}}{\text{Capital employed}}$$

Turnover = Sales net of returns, and

Capital employed = Fixed assets + net working capital.

(3) Debt Equity Ratio: It is calculated by dividing the debt with equity. It shows the relationship between debt and equity. The Ideal ratio is 2:1.

$$\text{Debt equity ratio} = \frac{\text{Debt}}{\text{Equity}}$$

Debt = Borrowed fund, and Equity = Share capital + Reserve and surplus - loss (as per profit and loss account).

(4) Net Capital Ratio: This ratio measures the degree of financial safety over a period of time. It indicates the long liquidity position of the firm business.

$$\text{Net Capital Ratio} = \frac{\text{Total assets}}{\text{Total debt}}$$

Total debt = Current liability + term liability.

Credit Deposit Ratio (CDR)

This ratio indicates the disbursement of credit per unit of deposit.

$$\text{Credit deposit ratio} = \frac{\text{Total amount of credit}}{\text{Total amount of deposits}} \times 100$$

RESULTS AND DISCUSSION**Performance of Flow of Institutional Finance to Agriculture Sector**

The year-wise progress of the deposit and advances of JAGB/SGB is furnished in Table 1. It is evident from the Table that the amount of deposit has increased from ₹913.55 lakh (1992-93) to ₹9578.78 lakh (2004-05). It has reached to the level of ₹ 84154.88 lakh during 2007-08 when all the RRBs of Saurashtra were merged and came into existence as Saurashtra Gramin Bank. The amount of advance made available increased from ₹ 562.67 lakh (1992-93) to ₹ 4890.12 lakh (2004-05) and after merged in SGB, it has increased from ₹ 36848.71 lakh (2005-06) to ₹ 54495.91 lakh (2007-08). In case of agricultural sector, the advances increased from ₹ 331.44 lakh (1992-93) to ₹ 3891.99 lakh (2004-05) and from ₹ 30042.71 lakh (2005-06) to

₹ 44825.29 lakh (2007-08). A considerable increase in advances to agricultural sector implies that this RRB has played a significant role to cater to the needs of rural poor. In total advance, the share of agricultural sector was very high in all years. The Table also indicates that credit deposit ratio was found no uniformity and ranged between 34.47 per cent (1995-96) to 66.99 per cent (2005-06). The C.D. ratio of SGB was more than 60 per cent in all the years. This shows a healthy sign. The number of staff and branches showed a declining trend in case of JAGB. Vyas and Shiyani (1997) found a significant increase in deposit and total advance of JAGB. Adinew Abate *et al* (2002) also found that agricultural loan and advances has shown significant growth in commercial and regional rural banks in Karnataka.

Table 1: Progress of Junagadh Amreli Gramin Bank/Saurashtra Gramin Bank in Various Banking Parameters

	Year	No. of Branches	Staff	Deposits (₹ '000)	Total Outstanding (₹ '000)	Outstanding of agricultural loan (₹ '000)	CD ratio (%)
(A)	1992-93	41	142	91355	56267	33144	61.60
JAGB	1993-94	41	141	126531	63758	41447	50.38
	1994-95	41	141	152559	65808	36628	41.11
	1995-96	41	141	218118	81526	48408	34.47
	1996-97	41	138	303792	116011	90614	38.19
	1997-98	37	138	389720	178746	131506	46.00
	1998-99	38	135	476905	223966	165628	47.00
	1999-00	38	135	562062	277760	209588	49.00
	2000-01	36	134	588752	323310	247376	55.00
	2001-02	35	132	652652	349125	272454	53.50
	2002-03	34	131	744728	375306	294363	50.30
	2003-04	34	129	811339	395333	307116	48.70
	2004-05	34	130	957878	489012	389199	51.05
	2004-05	141	488	4870039	2939542	2314584	60.36
(A)	2005-06	141	487	5500915	3684871	3004271	66.99
SGB	2006-07	142	484	6813200	4490758	3809040	65.91
	2007-08	143	482	8415488	5449591	4482529	64.76

Table 2 reveals the year-wise trend of all loan disbursed to agricultural sector. The Table shows that the disbursement of total loan increased from ₹ 307.21 lakh (1992-93) to ₹ 4435.67 lakh (2004-05) and after merged, it increased from ₹ 31900.00 lakh (2005-06) to ₹ 43717.18 lakh (2007-08). In case of agricultural sector, it increased from ₹ 233.17 lakh (1992-93) to ₹ 3914.39 lakh (2004-05) in case of JAGB, while in respect of SGB, it increased from ₹ 28022.00 lakh (2005-06) to ₹ 38518.33 lakh (2007-08). The share of agricultural loan in the total loan was more than 75 per cent in all the

years, it was as high as 91.02 per cent during the year 2006-07. This implies that the SGB has given due weightage to agricultural sector which is a backbone of our economy. Further, it can also be seen from the Table that the per cent increase in advances to agricultural sector over the previous year was relatively higher as compared to that of total advances in 11 years. This was mainly due to the change in attitude of farmers from subsistence farming to commercial farming and favourable reforms in banking sector.

Table 2: Year-wise Disbursement of Loan by JAGB/SGB

	Year	Total loan disbursed (₹ '000)	Increase over previous year (%)	Loan disbursed to farm sector (₹ '000)	Increase over previous year (%)	% of agricultural loan to total loan
(A)	1992-93	30721	—	23317	—	75.90
JAGB	1993-94	39831	29.65	31895	36.79	80.08
	1994-95	43472	9.14	34869	9.32	80.21
	1995-96	63348	45.72	54771	57.08	86.46
	1996-97	105005	65.76	80885	47.68	77.03
	1997-98	156976	49.49	119116	47.27	75.88
	1998-99	169212	7.8	132214	11	78.14
	1999-00	188503	11.4	147535	11.59	78.27
	2000-01	220691	17.08	182977	24.02	82.91
	2001-02	245280	11.14	210254	14.91	85.72
	2002-03	272130	10.95	230619	9.69	84.75
	2003-04	342984	26.04	291502	26.4	84.99
	2004-05	443567	29.33	391439	34.28	88.25
	2004-05	2538890	-	2180690	-	85.89
(B)	2005-06	3190000	25.65	2802200	28.5	87.84
	2006-07	3915678	22.75	3564205	27.19	91.02
SGB	2007-08	4371718	11.65	3851833	8.07	88.11

Perusal of Table 3 reveals year-wise progress of JAGB and SGB in relation to its business, total income and total expenditure. It is apparent from the data that the business of JAGB/SGB showed continuous increasing trend. It increased from ₹ 1476.82 lakh (1992-93) to ₹ 14468.90 lakh (2004-05) for JAGB and from ₹ 91857 lakh (2005-06) to ₹ 138651 lakh (2007-08) in case of SGB. An increasing trend in income

was noticed up to the year 2002-03 but it has declined in the subsequent two years. Almost similar trend was noticed in case of expenditure too. This result lead to conclude that there was a considerable increase in the magnitude of deposits, loan disbursement to agricultural sector, total income and also in total expenditure of the bank. The share of agriculture loan in total loan was found quite high.

Table 3: Trend in Financial Performance of JAGB/SGB

(₹ '000)				
	Year	Business	Total income	Total expenditure
(A)	1992-93	147682	13806	19728
JAGB	1993-94	190281	17961	24652
	1994-95	218366	17000	27519
	1995-96	299587	25132	35850
	1996-97	419799	36594	40259
	1997-98	568466	57506	46269
	1998-99	700871	79340	64646
	1999-00	839822	99667	79905
	2000-01	912062	108435	87456
	2001-02	1001777	114451	98964
	2002-03	1119534	118357	103859
	2003-04	1206672	108150	93322
	2004-05	1446890	97666	89696
	2004-05	NA	NA	293302
	2005-06	9185700	121706	113670
(B)	2006-07	11304000	629699	600392
SGB	2007-08	13865100	746349	708152

NA = Data not available.

Financial Performance and Viability of Selected Banks

The financial performance of a bank greatly influences its operational results and business efficiency. Therefore, it is highly needed to evaluate the financial performance of JAGB/SGB in relation to efficiency in mobilising the required resources and effectiveness in utilising these resources. In order to study the financial performance of the bank, the ratio analysis technique was regarded as useful tool in the hand of the bank. The ratios indicate improvement over the past performance and satisfactory positions. Various ratios were used in the study to examine the performance and viability of bank.

Liquidity Ratio: The short-term financial position of the bank is assessed on the basis of liquidity ratio. It is expected that the bank should be in a position to satisfy his day-to-day commitment in the form of current liabilities out of the current assets. Liquidity ratio indicates the financial liquidity of the bank.

The current ratio: The ratio of current assets to current liabilities termed as current ratio which shows the ability of the bank to meet its short-term (one year's time) obligation.

The quick ratio: The ratio of quick assets to quick liabilities termed as quick ratio which shows the ability of the bank to meet its very short-term obligation.

Quick ratio provides better measure of liquidity than current ratio while, current ratio in effect reflecting liquidity within one year's time. So there is a need to know quick assets and liabilities position of bank which is provided by quick ratio.

The year-wise results of current ratio and quick ratio are presented in Table 4. An uniform trend of current ratio was noticed for the entire period. It ranged between 1.28:1 (2003-04) to 1.91:1 (1993-94) with an overall average of 1.53:1 for Junagadh Amreli Gramin Bank and

1.31:1 (2006-07) to 1.80:1 (2005-06) with an overall average of 1.50:1 in case of Saurashtra Gramin Bank. This implies that, on an average, every one rupee of current liabilities, the bank has been maintaining asset of more than ₹ 1.50. It is obvious that the minimum level of current assets should be equivalent to current liability. Ideally, this ratio must be at least 1.33 as per the guideline on priority sector and special credit schemes, provided by S. Rajendran-2002. Keeping in view these guidelines it can be concluded that financial position of the bank was found satisfactory.

No uniformity was observed in quick ratio of the bank. It ranged between 0.43:1 (2004-05) and 2.19:1 (1993-94) with an overall average of 1.25:1 for Junagadh Amreli Gramin Bank, whereas for SGB, it ranged between 0.31:1 (2007-08) and 0.72:1 (2005-06) with an overall average of 0.52:1. It shows that, on an average, every one rupee of quick liabilities, the bank has been maintaining an asset of ₹ 1.25 and ₹ 0.52 for Junagadh Amreli Gramin Bank and Saurashtra Gramin Bank, respectively. The desirable level of quick ratio is greater than or equal to one. Thus, it can be concluded that the short-term solvency and liquidity position of JAGB was sound. This ratio measures the relationship between cash and near cash items on one hand, and immediately maturing obligation on the other. It signifies that liquid assets were sufficient for meeting short-term liabilities. On the other hand, the position of SGB was found relatively weak as the average quick ratio was only 0.52.

Reddy (1994) also indicated that the liquidity position of the Mulkanoor cooperative rural bank as revealed by current and quick ratios was sound.

Table 4: Liquidity Ratios of Junagadh Amreli Gramin Bank/Saurashtra Gramin Bank

(₹ '000)							
	Year	Asset	Liability	Current		Quick	
				Ratio	Asset	Liability	Ratio
(A)	1992-93	124364	71236	1.75	63189	33622	1.88
JAGB	1993-94	171917	89808	1.91	98146	44887	2.19
	1994-95	190582	1132277	1.68	106232	63870	1.66
	1995-96	239986	148806	1.61	136301	86712	1.57
	1996-97	341569	209961	1.63	205489	126981	1.62
	1997-98	379071	259573	1.46	202108	151499	1.33
	1998-99	415760	305734	1.36	201894	171653	1.18
	1999-00	472083	343592	1.37	220337	202293	1.09
	2000-01	548669	378539	1.45	247890	227303	1.10
	2001-02	638523	412329	1.55	265815	270096	0.98
	2002-03	618912	415580	1.49	243790	301008	0.81
	2003-04	550933	429336	1.28	161499	353817	0.46
	2004-05	579613	411380	1.41	136632	321327	0.43
	2004-05	3960974	2795602	1.42	833031	1999726	0.42
	2005-06	4843390	2649589	1.83	1713258	2385416	0.72
(B)	2006-07	5942628	4537962	1.31	1951735	3089690	0.61
SGB	2007-08	5992865	4413284	1.36	1128570	3617936	0.31
Average of JAGB				1.53			1.25
Average of SGB				1.50			0.52

Profitability Ratio

Gross Profit Ratio: This ratio indicates the margin available to the bank which covers indirect expenses. It is a relative term, it should be adequate and it is explained in percentage.

Table 5 revealed year-wise profitability ratios like gross profit, net profit and return on assets and return on capital employed ratio. Gross profit ratio ranged from 1.75:1 (1994-95) to 5.32:1 (2000-01) with an overall average of 3.87 for JAGB and for SGB, it ranged between 0.52:1 (2005-06) and 2.51:1 (2006-07) with an overall average of 1.41. It showed no uniform trend during the period under study.

Net Profit Ratio and Return on Assets Ratio :

This ratio indicates the efficiency of the bank considering all the expenses. Net profit ratio and return on assets were found negative during the period from 1992-93 to 1996-97 and in remaining years, it was positive. The return on investment shows an improvement over a period of time. This implies that the assets of the bank are properly and prudentially utilised to generate revenue income.

Operating Profit Ratio: It indicates a relationship of expenses to sale. The lower ratio indicates better management of funds. This ratio was found negative during 1992-93 to 1996-97 and in remaining years it was positive. It was greater

than one during 1997-98 to 2003-04 but less than unity from the year 2004-05 onwards.

Return on Capital Employed Ratio: This ratio was found less than one in all the years under study,

except for the years 1998-99, 1999-00 and 2003-04. Profitability ratio was found low because regional rural banks advanced its larger share to priority sectors at relatively lower rate of interest.

Table 5 : Profitability and Return on Investment Ratios of JAGB/SGB

	Year	Gross profit ratio	Net profit ratio	Operating profit ratio	Return on assets ratio	Return on capital employed
(A)	1992-93	2.57	-4.42	-3.81	-6.13	0.26
	1993-94	2.53	-3.88	-2.88	-7.25	0.22
	1994-95	1.75	-5.22	-3.69	-12.40	0.24
	1995-96	2.11	-3.91	-2.64	-13.60	0.31
	1996-97	2.75	-0.96	-0.04	-3.71	0.35
	1997-98	5.07	2.20	2.09	11.45	0.69
	1998-99	5.15	2.36	2.37	12.91	1.02
	1999-00	5.26	2.67	2.86	16.19	1.06
	2000-01	5.32	2.61	2.88	16.72	0.90
	2001-02	5.11	1.75	1.83	5.90	0.78
	2002-03	5.00	1.45	1.76	8.05	0.75
	2003-04	4.56	1.35	1.30	3.15	1.00
	2004-05	3.14	0.59	0.59	1.96	0.72
	2004-05	-	-	-	0.54	0.17
	2005-06	0.52	0.09	0.12	0.57	0.07
	2006-07	2.51	0.27	0.80	2.47	0.47
	2007-08	2.21	0.29	0.72	3.64	0.48

Turnover ratio indicates that, on an average, a rupee invested in current assets could create worth of business to the bank.

The data furnished in Table 6 indicate year-wise working capital turnover ratio, capital employed turnover ratio, debt equity ratio and net capital ratio. It is evident from the Table that working capital turnover ratio and capital employed turnover ratio were found greater than unity in almost all the years. In both the ratios, the lowest values were noticed in 1993-94 and the highest was reported during the year 2003-04 due to rapid increase in share capital of

the bank. The results of these ratios indicate that on an average, a rupee invested in current assets could create ₹ 4.57 and ₹ 4.50 worth of business in JAGB and in case of SGB, it was ₹ 6.68 and ₹ 6.63, respectively.

The debt equity ratio measures the long-term solvency and ability of the bank to meet long-term liabilities. It is acceptable as 1:1 and under Indian conditions 34 per cent equity is considered as reasonable as per the guideline on priority sector and special credit schemes, provided by S. Rajendran-2002.

The debt equity ratio was found non-uniform and it ranged from 1.08 (1993-94) to 4.26 (2003-04). It indicates that more fund required by the bank are provided by creditors.

the long liquidity position of the banks business. Net capital ratio was found more than unity in all the years. On an average, it was 1.09:1 which showed long financial safety over a time.

Net capital ratio measures the degree of financial safety over a period of time. It indicates

Table 6: Turnover/Active Ratios and Solvency Ratio of JAGB/SGB

	Year	Working Capital turnover ratio	Capital employed turnover ratio	Debt equity ratio	Net capital ratio
(A)	1992-93	2.52	2.47	1.16	1.06
JAGB	1993-94	2.10	2.08	1.08	1.06
	1994-95	2.60	2.58	1.26	1.06
	1995-96	3.01	2.98	1.58	1.05
	1996-97	2.91	2.89	1.48	1.12
	1997-98	4.28	4.24	2.17	1.10
	1998-99	5.65	5.59	3.08	1.09
	1999-00	5.76	5.71	3.22	1.07
	2000-01	4.72	4.69	2.58	1.09
	2001-02	3.92	3.88	2.05	1.10
	2002-03	4.92	4.88	2.57	1.12
	2003-04	9.03	8.70	4.26	1.12
	2004-05	8.02	7.83	3.72	1.12
	2004-05	0.00	0.00	2.63	1.09
	(B)	2005-06	4.13	4.11	1.42
SGB	2006-07	7.60	7.54	2.65	1.07
	2007-08	8.31	8.25	3.04	1.07
	Average JAGB	4.57	4.50		1.09
	Average SGB	6.68	6.63		

Economic Performance Ratios

Burden Efficiency Ratio: It indicates burden of operating expenses on business, so lower the ratio indicates good performance of the bank.

Efficiency Ratio: It indicates every one rupee of income how much cost is incurred so lower the ratio indicates efficient performance of the bank.

Table 7 reveals year-wise various economic performance parameters of the bank, like burden efficiency ratio, efficiency ratio, business growth ratio and operating expenses growth ratio. The data indicated that burden efficiency ratio has declining trend, except the years 1994-95, 2001-02, 2002-03, 2004-05 and 2006-07. It ranged from 0.59:1 (1994-95) to

0.003:1 (2005-06). This indicates good efficiency of bank.

Business Growth Ratio: It also indicates non-uniform trend and it remained more than unity and indicated that business increased compared to previous year. It ranged between 1.08:1 (2003-04) to 1.40:1 (1996-97) and on an average, the business increased by 22 per cent for the RRB indicating significant growth in business.

Operating Expenses Growth Ratio : It also showed non-uniform trend and ranged between 0.96:1 (2004-05) and 1.49:1 (2001-02) for JAGB. In case of SGB, it varied between 1.07:1 (2007-08) and 5.08:1 (2006-07).

Table 7: Economic Performance Ratios of JAGB/SGB

Year	Burden Efficiency ratio	Efficiency ratio (cost-income)	Business growth ratio	Operating expenses growth ratio
(A) 1992-93	0.057	2.72	NA	NA
JAGB 1993-94	0.053	2.54	1.29	1.18
1994-95	0.059	3.98	1.15	1.27
1995-96	0.041	2.36	1.37	0.97
1996-97	0.028	1.35	1.40	1.04
1997-98	0.022	0.57	1.35	1.03
1998-99	0.021	0.54	1.23	1.18
1999-00	0.020	0.49	1.20	1.11
2000-01	0.019	0.46	1.09	1.02
2001-02	0.026	0.64	1.10	1.49
2002-03	0.028	0.65	1.12	1.11
2003-04	0.020	0.71	1.08	1.10
2004-05	0.021	0.81	1.20	0.96
2004-05	NA	NA	NA	NA
2005-06	0.003	0.77	NA	NA
(B) 2006-07	0.013	0.68	1.23	5.08
SGB 2007-08	0.009	0.67	1.23	1.07

NA = Data not available.

Operational Performance Ratios : Table 8 reveals year-wise operational performance ratios like productivity per staff, per branch, uses to source ratio and non-performing advances (NPA) ratio of the bank. It can be seen from the Table that productivity per staff and per branch increased continuously in all the years. After the merger of JAGB into newly formed Saurashtra Gramin Bank, a considerable increase in both the productivities was noticed. This implies that the efficiency of bank's staff improved significantly in the era of competition. This is a healthy sign and the bank has to maintain this tempo in future as well to keep pace with the

changed scenario at national and international levels.

Uses to source ratio indicate that progress in fund development were on an average, 40 and 62 per cent in JAGB and SGB, respectively. Non-performance advance ratio showed nearly decreasing trend except for the period 2000-01 to 2002-03. It is also good sign of operational performance.

On the whole, the performance and viability revealed by various ratios were found sound and considerable improvement of the bank, in size and volume of business during study period.

Table 8: Operation Performance Ratios of Junagadh Amreli Gramin Bank/ Saurashtra Gramin Bank

(₹ '000)

	Year	Productivity per staff	Productivity per branch	Uses to sources ratio	Non-performing advances
(A)	1992-93	1040	3602	0.46	0.000
JAGB	1993-94	1340	4641	0.38	0.000
	1994-95	1549	5326	0.33	0.000
	1995-96	2125	7307	0.30	0.000
	1996-97	3042	10239	0.31	0.187
	1997-98	4119	15364	0.37	0.108
	1998-99	5192	18444	0.38	0.108
	1999-00	6221	22101	0.39	0.097
	2000-01	6806	25335	0.43	0.128
	2001-02	7589	28622	0.44	0.122
	2002-03	8546	32927	0.43	0.152
	2003-04	9354	35490	0.47	0.081
	2004-05	11130	42556	0.49	0.031
	2004-05	NA	NA	0.65	0.022
(B)	2005-06	18862	65147	0.67	0.019
SGB	2006-07	23355	79606	0.56	0.017
	2007-08	28766	96959	0.60	0.016

NA = Data not available.

Summary and Conclusions

Agriculture is backbone of Indian economy. It is the largest sector of the economic activity which provides not only food and raw material but also employment to a vast proportion of population of India. The improved technology has now become capital intensive by attracting huge amount of capital for investment in this sector. For achieving the desired growth to improve the living standard of people, institutional credit has been introduced as an instrument by various scheduled banks. The mobilisation of scarce resources especially financial resources in planned manner is given due attention. Institutional finance is considered as principal source of external finance to support and accelerate the development of the agricultural sector. Provision of adequate, timely, and liberal credit to the farmers has become an integral part of the agricultural development policy in India. Thus, it is necessary to provide credit to this crucial sector. Flow of credit to agricultural sector is the major common problem which plays dominant role in adoption of modern farm technology. For smooth and constant flow of credit, healthy institutional agency is essential so that it can provide needed credit to agricultural sector.

The C.D. ratio of SGB was found more than 60 per cent during the entire period which showed healthy sign of bank. Declining trend of number of staff and branches of the bank was noticed. In case of SAGB, total staff declined from 142 (1992-93) to 130 (2004-05) while the branches declined from 41 (1992-93) to 34 (2004-05). This implies better productivity of staff and bank which is essential in the era of competition.

Considerable increase was found in various indicators of bank like deposits from ₹ 913.55 lakh to ₹ 84154.88 lakh, total outstanding from ₹ 562.67 lakh to ₹ 54495.91 lakh and agricultural outstanding from ₹ 331.44

lakh to ₹ 44825.29 lakh during the entire study period.

Total loan disbursed by JAGB/SGB increased from ₹ 307.21 lakh (1992-93) to ₹ 43717.18 lakh (2007-08), while the disbursement of agricultural loan increased from ₹ 233.17 lakh to ₹ 38518.33 lakh during the study period. A quantum jump in the disbursement of agricultural loan could be attributed mainly to the concentrated efforts of the bank's staff and financial sector reforms. The share of agricultural sector in total loan disbursed was found very high (more than 75 per cent) during the study period indicating due emphasis of bank on priority sector lending. Considerable increase in loan disbursed to farm sector over previous year was found and it was the highest (57 per cent) in 1995-96. The volume of business expanded from ₹ 1476.82 lakh to ₹ 138651.00 lakh, total income from ₹ 138.06 lakh to ₹ 7463.49 lakh and expenditure increased from ₹ 197.28 lakh to ₹ 7081.52 lakh, during 1992-93 to 2007-08.

The liquidity position of the JAGB as revealed by current ratio and quick ratio was sound with the average of 1.53 and 1.25, respectively. The corresponding figures for SGB were 1.50 and 0.52. Profitability and return on investment showed an improvement over a period of time which was reflected by the higher gross profit ratio (1:3.87). The capital turnover ratio indicates sound performance and long-term financial safety of the bank over a period of time. Working capital and capital employed turnover ratios were found, on an average, 4.57:1 and 6.68:1 and 4.50:1 and 6.63:1 for JAGB and SGB, respectively, while net capital ratio was more than unity during the study period. Debt equity ratio indicates long-term solvency which showed that higher fund requirement of the bank was provided by creditors. Economic performance ratios and operational performance ratios showed expected performance and improvement in size and volume of business. Productivity per staff and per branch increased

from ₹ 10.40 lakh to ₹ 287.66 lakh and ₹ 36.02 lakh to ₹ 969.59 lakh during the study period indicating the expected level of bank performance. In operational performance, a considerable improvement was found in terms of size and volume of business.

Concluding Remarks

(i) Adequate and continuous efforts should be made to educate the borrowers regarding end-use of credit for timely repayment of loans.

(ii) The simplification of loaning procedure is highly essential to increase flow of institutional finance to agricultural sector and reduce the cost of credit and to get rid off farmers from tedious and lengthy procedure.

(iii) The institutional agencies should arrange to provide adequate information about loan system and to educate borrowers about the positive impact of institutional credit.

(iv) To improve the quality of lending, efficiency of personnel and other related matters the banks should set up separate research and development cell at the zonal and central office levels.

(v) Financing institutions should increase their agricultural lending without significant increment in the cost of credit.

(vi) Agricultural credit policy of the various banks should keep the poorer farmers as their target-group and draw up an appropriate credit policy that caters to the need of the target-group. Also the cost of credit for target-group should be respectively, lower than the cost of credit to the non-target group of borrowers.

(vii) The financing institutions should give more emphasis on social background and attitude towards credibility of the borrowers in evaluating the prospective borrowers.

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Appendix I : Name of Junagadh-Amreli Gramin Bank Branches

S. No.	Name of Branch	S. No.	Name of Branch	S. No.	Name of Branch
1	Junagadh	13	Kesharia	25	Mota Barman
2	Naredi	14	Chandwana	26	Datardi
3	Tikar	15	Virdi	27	Khambhala
4	Dhava	16	Mendarda	28	Sanali
5	Talala	17	Mekhdi	29	Keriachard
6	Kevadra	18	Bhanduri	30	Amreli
7	Nanadia	19	Ajotha	31	Balej
8	Mendpara	20	Hemal	32	Khambhodar
9	Savani	21	Amba	33	Garej
10	Mota Samadhiala	22	Dharagni	34	Sisli
11	Vadhavi	23	Saladi		
12	Amodra	24	Pipalva		

Appendix II : Name of Saurashtra Gramin Bank Branches

S. No.	Name of Branch	S. No.	Name of Branch	S. No.	Name of Branch
Jamnagar region					
1	Amra	17	Haripar	33	Moti-gop
2	Amran	18	Jaiva	34	Navagam
3	Bankodi	19	Jamdudhai	35	Navagam ghed
4	Beraja	20	Jam-khabhalia	36	Pachhatar
5	Bhadra	21	Jamanagar	37	Padana
6	Bhangor	22	Khadkhambhalia	38	Papertoda
7	Bhan-khokhari	23	Khirasara	39	Pithad
8	Bhanvad	24	Lalpur	40	Ran
9	Chela	25	Makarani-sanosra	41	Sasodar
10	Devalia	26	Matwa	42	Sheth-vadala
11	Dhrol	27	Meghpar	43	Shiva
12	Dhunvav	28	Mota-gunda	44	Surajkaradi
13	Dhutarpar	29	Mota-itala	45	Vadatara
14	Falla	30	Mota-panchdevda	46	Varvala
15	Gadhaka	31	Mota-vadala	47	Viramdad
16	Gingani	32	Moti-banugar		

Surendranagar region

1	Adariyana	16	Lilapur	31	Rajpara
2	Anandpur	17	Limbadia	32	Rampara
3	Bajud	18	Mahuva	33	Rohishala
4	Bhavnagar	19	Mangadh	34	Sanosra
5	Bodananesh	20	Mayurnagar	35	Sarva
6	Botad	21	Methan	36	Shekhpar
7	Chotila	22	Morthara	37	Surendranagar
8	Dedara	23	Motaankevaliya	38	Tajpar
9	Devli	24	Motimoldi	39	Talaja
10	Dhrangdhara	25	Nagnesh	40	Tarsamiya
11	Dudhala	26	Nanaakhevaliya	41	Tatam
12	Halvad	27	Nanaashrana	42	Umarda
13	Jambu	28	Padva	43	Valukad
14	Jasapar	29	Palitana	44	Wadhawan
15	Kuntalpar	30	Patdi		

Junagadh region

1	Ajotha	16	Junagadh	31	Pipalva
2	Amba	17	Keriachad	32	Rajkot h. O. Branch
3	Ambardi	18	Kesharia	33	Rajkot mavdi road
4	Amodra	19	Kevadra	34	Saladi
5	Amreli	20	Khajurda	35	Sanali
6	Balej	21	Khambhala	36	Savani
7	Bhanduri	22	Khabhodar	37	Sisli
8	Chandwana	23	Maliyasan	38	Talala
9	Datardi	24	Mekhdi	39	Tikar
10	Dharagni	25	Medarda	40	Vadhavi
11	Dhava	26	Mendapara	41	Virdi
12	Dodiyala	27	Mota barman	42	Wavkaner
13	Garej	28	Mota samadhiala		
14	Gondal	29	Nanadia		
15	Hemal	30	Naredi		

LAND DISPOSSESSION AND RURAL TRANSFORMATION : THE CASE OF FRINGE VILLAGES OF KOLKATA

Chinmoyee Mallik*

ABSTRACT

Traditional understanding of rural transformation, although pertains to processes associated with agricultural development, rural poverty or urbanisation, the recent times have witnessed additional micro-processes in relation to state policies that not only affect rural lives but also compel them to undergo far-reaching changes. State-perpetrated land acquisition offers perhaps the most unambiguous shock to the rural lives as it directly impinges upon the economic base of the rural population. The recent massive land acquisition for the Rajarhat New Town project in West Bengal near Kolkata offers a pertinent case for the study of the nature of rural transformation invigorated by land dispossession. Attempting to analyse the trajectory of occupational transformation following land loss of the farmers (land owners as well as pure tenants) on one hand and on the other hand the role of access to assets in determining it, the paper has succinctly pointed out the following: firstly, a rapid de-stabilisation of the self-contained peasantry and their subsequent absorption into the manual jobs on one hand and business enterprises on the other the trajectory being guided by base asset position, access to land in specific, prior to land loss; secondly, a remarkable downward occupational mobility for the land dispossessed farmers in general and more so in case the pure tenants completely lost land households; and thirdly, a clear mismatch between the skill endowment of the land dispossessed farmers and the emerging activities in the study region that thrust the farmers into a tumultuous condition. It therefore, prompts one to question the route to urbanisation-industrialisation embarked upon by the Government that unambiguously impoverishes the peasantry and triggers a peculiar type of rural transformation that promises adversity.

Background of the Study

Rural change in India heralded by the Green revolution has been followed by a remarkable tendency of the economy to tilt in favour of non-farm employment in the recent times (Chandrashekhar, 1993; Chadha et al, 2002;

Kundu et al, 2005). Many rural areas have witnessed the proliferation of a wide spectrum of non-agricultural work which often accounts for nearly half the income of the households (Start, 2001). It has stemmed principally from two sources: firstly, agricultural development

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leading to its commercialisation and spread effects encouraging the growth of agricultural support services. As explicated by John Mellor, non-farm diversification is the manifestation of the transfer of increased net gains from highly productive agriculture to a capitalist transformation of the economy through re-investment in rural industry on one hand and increased demand for non-agricultural goods and services induced by enhanced purchasing power. The second proposition regarding its origin considers the rural non-farm economy (RNFE) as an image of the urban informal sector reflecting the spill over into low paid alternative employment of a population unable to sustain its living on land because of population pressure and an inadequate development of agriculture (Chandrashekar, 1993; Vaidyanathan, 1986). Thus the residual sector hypothesis emphasises the distress induced route to the development of the RNFE. Urbanisation has also emerged as a reason leading to the growth and expansion of the RNFE (Eapen, 2001; Lanjouw and Murgai, 2010). Understandably, rural transformation may be induced by prosperity, distress or a combination of both. It is also the result of combined push-pull forces of the rural and urban economies. It is a process whereby the rural economy adjusts gradually to either the stress accumulating within it or attempts to capitalise on the benefits of prosperous agriculture. Scholars argue that this is a manifestation of the rural sector undergoing a structural transformation (Unni, 1989, 1993; Start, 2001). Thus, it is a process that operates over a considerable period of time and the changes in the economy become evident very gradually. It is an outcome of the critical balance between the propensities of the rural sector to remain heavily dependent upon agriculture and the forces that induce diversification.

Contrary to the traditional understanding of rural change as a long-term process, it is important to take note of some of the drastic events that may potentially modify the practised

mode of the rural economy. Besides any natural disaster it may take the form of change in policy guideline that may modify the nature and pattern of access to resources. Land acquisition is one such institution that involves a direct transfer of agricultural land to non-agricultural uses. It may be conceived as potent stimulant for rapidly changing the farm economy. The urban fringes of the large cities have evolved as the hot-spots of globalised capital where the progressive land alienation processes have triggered intense rural change commonly to the adversity of the rural population. In a situation where the principal mode of sustenance, that is, land have been institutionalised to slip away from the control of the peasants there hardly remains any other option but to diversify towards activities that are de-linked from land. The modification of the rural economy which essentially emanates from anguish calls for deep scrutiny regarding the robustness of such a transformation.

That the rural non-farm economy (RNFE), far from being homogeneous, reveal an extremely heterogeneous character, further complicates the trajectory of adaptation embraced by the rural population. The asset position determines the distribution of the incremental income stemming from RNFE among the different factions of the rural population. In a peri-urban locale, access to livelihood assets, particularly land plays all the more important role in the process of transforming the spatial characteristics of the peri-urban interface into opportunities rather than constraints (Mallik & Sen, 2011) as proximity to the city encourages land speculation which favours the landed gentry and marginalises the landless population. Also, access to land corresponds with other livelihood assets like good education and productive social contacts that smoothen the process of economic transition in general and especially during the event of land dispossession.

Located in this context, this paper purports to explore the impact of rapid land-use change following planned urban expansion along the fringes of Kolkata in terms of sustainability of rural livelihoods. Kolkata has been selected as a case study since the fringes of the city has been experiencing accelerated eastward expansion and massive re-organisation of economic space, particularly as a result of coming up of Rajarhat New Town Project (NTP). Kolkata poses to be an interesting case study since the politico-social upsurge following the ruthless onslaughts by the Leftist State government upon the poor peasantry in the name of urban development has not only shoved it into a pivotal position on the global platform, but has also generated copious debates and deliberations among the academia regarding the customary development paradigm.

A rural space that has been recently exposed to urban land intrusion would experience massive reorganisation of the means of production in a way that has been both negotiated as well as contested. Access to land that was central to the attainment of a meaningful livelihood is posited with the challenge of retaining its pre-eminence by the land acquisition. Consequently a range of alternative activities would emerge that would be essentially de-linked from land. The non-agricultural activities ranging between extremely high return enterprise to menial labouring occupations would entail that location of any household within the diverse spectrum would be guided by the pre-existing economic disposition of the households. Therefore, the central thesis of this paper is that the inevitable process of rural transformation under the aegis of urban expansion would bear different implications for livelihoods for those having differential access to livelihood assets commonly favouring the asset-rich and subsequently pushing the asset-poor further towards the peripheries.

Data and Methodological Issue

The paper is an outcome of a primary survey conducted during 2010- 2011 in three villages affected by massive land acquisition by the government of West Bengal for developing the Rajarhat New Town. Land had been acquired for the New Town in phases since 2003. Combining the land acquisition data obtained from the District Collectorate and Census 2001 village directory to select three villages based on the following two criteria: (a) considerable share of agricultural workforce in 2001 census and agriculture the mainstay of the people in the pre-acquisition period, (b) considerable share of land acquired by State recently and yet some agricultural land remaining and being cultivated. The villages of Akandakeshari, Chhapna and Patharghata were selected based on the above outlined criteria.

About 82 households affected by land acquisition and 30 control samples were selected through stratified random sampling technique to look into the nature of change in the livelihood embarked upon by the affected households. It must be pointed out that the samples constitute of only those households whose principal source of income had been agriculture prior to land loss. It includes both the owner cultivators as well as tenant cultivators. So, the sample contains some pure tenants whose operational holdings had been completely tenanted and that they did not own any land before land acquisition. This category of farmers had access to land through the land lease market but had no land ownership.

Questionnaires were canvassed both at the household level and individual level (those whose age is above 15 years during the time of the survey). Hence, while some of the analysis is undertaken at household level, the study of employment pertains to individuals aged 15 years and above.

The section on occupational mobility does not use any subjective criteria for ranking

the occupations. Rather the occupations have been clubbed according to the NCO 2004 scheme to arrange the occupations hierarchically. NCO 2004 uses educational level and skill required for performing any particular occupation rather than the actual possession of those by the individual undertaking the specific activity. Noting the occupation of any individual both before and after land dispossession three categories of occupational mobility have been evolved: downward mobility, upward mobility and no change. This analysis excludes those individuals who have been non-workers either before or after land acquisition or both.

General Characteristics of the Sample : The sample consists of 80 households who have lost

land and another 30 households who have not lost land. Majority of them (45 per cent) have lost land completely to the New Town Project (NTP) and the rest have lost parts of their holdings (27 per cent) (Table 1). About 82 per cent of the households owned some land and cultivated either entirely ownership holdings or mixed holding (Table 2). The landless households (18 per cent) gained access to land through the lease market. Before land acquisition, agriculture had been the mainstay of all the sample households. The demographic composition, economic activity and educational attainments of the land lost and control samples do not differ markedly (Table 3).

Table 1: Types of Households

	N	%
Never lost land	31	27.4
Partially lost land	31	27.4
Completely lost land	51	45.1
Total	113	100.0

Source: Primary Survey 2010- 11.

Table 2: Household Characteristics

	Control		Land Lost	
	N	%	N	%
Households owning some land	26	83.9	67	81.7
Pure tenants	5	16.1	15	18.3
Total	31	100.0	82	100.0

Source: Primary Survey 2010- 11.

Table 3: Individual Characteristics

	Attributes	Control		Land Lost (Before LA)	
		N	%	N	%
Age composition	0-14	41	24.8	96	21.7
	15-59	107	64.8	304	68.8
	above 59	17	10.3	42	9.5
	Total	165	100.0	442	100.0
Economic characteristic (above 15 years)	Non- worker	66	53.2	208	60.5
	Primary sector	34	27.4	118	34.3
	Non- primary sector	24	19.4	18	5.2
	Total	124	100.0	344	100.0
Educational Attainment (above 6 years)	Pre- primary education	7	5.3	15	4.2
	Primary education	35	26.7	91	25.6
	Secondary education	73	55.7	189	53.2
	Higher secondary & above	16	12.2	60	16.9
	Total	131	100.0	355	100.0

Source: Primary Survey 2010- 11.

Analysis and Results

(a) Changes in Access to Land : The study revealed that access to land reduced remarkably among the sample households such that mean size of ownership holding declined from 3.63 bigha to 0.66 bigha while operational holding declined from 5.22 to 0.56 bigha owing to land acquisition for urban expansion (Tables 4 and 5). The pattern of access to land has changed considerably. While access to land with respect to both ownership as well as operational holding clearly informs massive incidence of

landlessness (the shares of landless households with respect to land ownership increased from mere 18 to 70 per cent and with respect to operational holding it has been an increase from 0 to 70 per cent), the respective shares of small, medium and semi-large farmers have also declined. It may be mentioned at this point that the structure of access to land of the control samples correspond to the pre-land dispossession condition of the land-lost farmers and that the current situation of the latter relates to land dispossession experience.

Table 4: Change in Land Ownership Before & After LA

	Before LA					After LA				
	Landless	Small	Medium	Semi-large	Total	Landless	Small	Medium	Semi-large	Total
Control	-	-	-	-	-	5	9	12	5	31
%	-	-	-	-	-	16.1	29.0	38.7	16.1	100.0
Land lost	15	26	27	14	82	57	19	5	1	82
%	18.3	31.7	32.9	17.1	100.0	69.5	23.2	6.1	1.2	100.0
Mean size of land ownership (Land Lost)			3.63				0.66			

Source: Primary Survey 2010- 11.

Table 5 : Change in Land Ownership Before & After LA

	Before LA					After LA				
	Landless	Small	Medium	Semi-large	Total	Landless	Small	Medium	Semi-large	Total
Control	-	-	-	-	-	0	16	11	4	31
%	-	-	-	-	-	0.0	51.6	35.5	12.9	100.0
Land lost	0	43	22	17	82	57	23	2	0	82
%	0.0	52.4	26.8	20.7	100.0	69.5	28.0	2.4	0.0	100.0
Land lost	15	26	27	14	82	57	19	5	1	82
%	18.3	31.7	32.9	17.1	100.0	69.5	23.2	6.1	1.2	100.0
Mean size of land operated (Land Lost)			5.22					0.56		

Source: Primary Survey 2010- 11.

Land, which was an immobile asset, immediately got transformed into financial capital in the form of cash compensation following acquisition. However, according to the Land Acquisition Act 1894, only the land owners and registered tenants were compensated for their reduced access to land. So, while land constituted the mainstay for all the households, the loss was compensated only for those who had legal sanction for their access. Receipt of compensation offered the land losers with an opportunity to make good their loss of land through the acquisition of other assets and largely bypassed the un-registered tenant farmers. The State government has offered around one lakh to 2.7 lakh per bigha of acquired land as compensation (Table 6). Analysing the pattern of spending of the compensation money it may be observed that largest share of it has been allocated to the improvement of existing housing stock and for the creation of new housing assets (35.6 per cent). Considerable shares of households converted their housing stock into productive capital and rented out part of their establishments. About one-third of the compensation has been expended for the acquisition of consumption item. The entire structure of physical asset basket of the region has therefore, tilted away from capital goods to

consumer goods- an observation relevant for most of the newly urbanising fringes (Mallik & Sen, 2011) and suggesting increasing vulnerability of the households. That merely 3 per cent of the entire compensation has been allocated for procuring productive assets further confirms that the eroding agricultural base not being replenished with non-agricultural capital leading to increasing livelihood insecurity. However, there has been some allocation of compensation amount towards business enterprises (13.8 per cent), financial investments (8.4 per cent) and savings (9 per cent) which together account for about one-third of the total money received.

The pattern of spending of the compensation illuminates the route of transformation of land asset to other assets. It suggests two things: firstly, decline in natural capital partly offset by increase in housing stock which has far reaching positive impact upon the health besides having productive income earning potential in the future owing to its peri-urban location; and secondly, modification of the physical capital basket in favour of items of conspicuous consumption clearly suggesting eroding livelihood sustainability. It must be emphasised that while the asset transformation issue in terms of circulation of the compensation

Table 6 : Use of Compensation

Uses	Amount (in ₹ Lakh at 2004-05 prices)	Mean
Construct houses/ improvement of existing buildings	124.23	35.66%
Consumption uses	118.12	29.69%
Business investment	59.33	13.88%
Savings	61.96	9.08%
Financial Investments	49.99	8.43%
Investments in productive assets	11.90	3.26%
Rate of compensation per bigha	₹ 1lakh to 2.73lakh per bigha	

Source: Primary Survey 2010- 11.

money is relevant for some of the land dispossessed households, in case of the unregistered tenant farmers it is an episode of recurring attrition of assets following land dispossession. Thus, the adjustment of the activity profile of the different categories of farmers is relevant for understanding their respective livelihood transformation experience.

(b) Principal Occupation: Work participation has remained almost unchanged with reference to principal occupation. However, there has been remarkable sectoral shift away from primary to secondary and tertiary sectors. For the land owning households, this shift has been more in favour of the tertiary sector while for the landless it is the secondary sector (Tables 7 and 8). The secondary sector mainly comprising construction related activities at the project site absorbed the majority of the land dispossessed pure tenant households while the landed households, perhaps by virtue of their pre-existing economic standing have been able to find relatively better tertiary work in the form of business enterprise. At this juncture it must be pointed out that both the types of work that have replaced the agricultural work of the land dispossessed farmers have been in relation to

the burgeoning construction industry. With shifting locus of the real estate activity, the profitability of the related enterprises also shifted regularly. Thus, even though the returns from the business enterprises in relation to the real estate activities have been significantly attractive towards the initial phase, this has been a temporary phenomenon. The engagement of the construction workers have also followed a similar pattern and hence have been extremely volatile, the demand for local labour being governed by the location of the construction site. Further, conversion of the farmers to non-workers following land loss (15.4 per cent) have revealed some relation to access to land prior to land loss. There has been greater shift towards non-workers in case of the land-owning households (17 per cent) compared to the pure tenant households (8.3 per cent) which perhaps suggests that the former have obtained some rentier type of income to sustain a living rather than non-availability of work. It also indicates that the latter whose livelihoods were relatively less resilient owing to their initial asset poverty has been subjected to intense pressure due to loss of access to land that have compelled them to undertake any type of work to sustain a living

Table 7: Principal Occupation: Work Participation Before & After LA (above 15 years)

		Before LA		After LA	
		N	%	N	%
Control	Non- worker	-	-	66	53.2
	Worker	-	-	58	46.8
	Total	-	-	124	100.0
Land lost	Non- worker	208	60.1	205	59.2
	Worker	138	39.9	141	40.8
	Total	346	100.0	346	100.0

Source: Primary Survey 2010- 11.

Table 8 : Principal Occupation: Sectoral Change in Employment Before & After LA

Category of Households	Before					After			
	Primary	Secondary	Tertiary	Total	Non-worker	Primary	Secondary	Tertiary	Total
Households owning some land	N	-	-	-	-	29	1	15	45
	%	-	-	-	-	64.4	2.2	33.3	100.0
Control	N	-	-	-	-	5	6	2	13
	%	-	-	-	-	38.5	46.2	15.4	100.0
Total	N	-	-	-	-	34	7	17	58
	%	-	-	-	-	58.6	12.1	29.3	100.0
Households owning some land	N	98	1	13	112	19	35	46	112
	%	87.5	0.9	11.6	100.0	17.0	31.3	41.1	100.0
Land lost	N	20	3	1	24	2	14	5	24
	%	83.3	12.5	4.2	100.0	8.3	58.3	20.8	100.0
Total	N	118	4	14	136	21	49	51	136
	%	86.8	2.9	10.3	100.0	15.4	36.0	37.5	100.0

Source: Primary Survey 2010- 11.

Table 9 : Principal Occupation: Change in the Nature of Work Before & After LA

Category of Households	Before					After				
	Casual Labourer	Self- employed	Regular salaried	Total	NA	Casual Labourer	Self- employed	Regular salaried	Total	
Households owning some land	N	-	-	-	-	8	32	5	45	
	%	-	-	-	-	17.8	71.1	11.1	100.0	
Pure tenants	N	-	-	-	-	6	6	1	13	
	%	-	-	-	-	46.2	46.2	7.7	100.0	
Total	N	-	-	-	-	14	38	6	58	
	%	-	-	-	-	24.1	65.5	10.3	100.0	
Households owning some land	N	4	103	5	112	19	39	47	112	
	%	3.6	92.0	4.5	100.0	17.0	34.8	42.0	100.0	
Pure tenants lost	N	4	19	1	24	2	17	4	24	
	%	16.7	79.2	4.2	100.0	8.3	70.8	16.7	100.0	
Total	N	8	122	6	136	21	56	51	136	
	%	5.9	89.7	4.4	100.0	15.4	41.2	37.5	100.0	

Source: Primary Survey 2010- 11.

following land dispossession. Given that the households who never lost land reveals about 60 per cent of them engaged in the primary sector in contrast to 11 per cent in case of the land dispossessed farmers confirms that there has not been adequate remunerative opportunities in the non-farm sector to encourage the voluntary transfer of the workforce away from agriculture. The shift towards non-farm sectors therefore, has been far from a gradual shift of the workforce away from the primary sector as argued by the Lewis model. So the farmers whose access to land has not been affected by land acquisition continue to depend upon agriculture even when the larger economic environment of the village has been changing in favour of non-agriculture.

The sectoral categories however do not convey adequate information about the quality of activities and therefore, call for deeper probe. Looking at the nature of work before and after LA, it has been observed that although the share of self-employed workers has reduced considerably it predominates the landed households. In case of the landless, casual labour which constituted 16.7 per cent of the workers before LA has increased to 70.8 per cent after LA (Table 9). Although the control households have manifested greater adherence towards self-employment (which in rural economy largely refers to the cultivator category) there has been about one quarter of them involved in casual work. Noticeably, the current level of casualisation among the farmers who have not

lost land is much higher than that of the land dispossessed farmers before land acquisition. This indicates that although the region have been experiencing casualisation of workforce in consonance with the national level trends, the landless households are marginalised to a greater extent compared to the land owning counterparts with respect to access to alternate work following land dispossession. Chadha et al (2002) have rightly expressed concern over the switch over from self-employed to casual work in rural India as it has been conceived as indicative of displacement of self-employed cultivators out of agriculture leading to rising shares of landless agricultural labourers which is the case in this study area. The above two observations indicate that land ownership have had some contribution in determining the direction of change in the nature of activity such that processes of casualisation have been under way in case of the landless to a greater extent than that experienced by the landed households.

(c) Subsidiary Occupation : Rural economy commonly dwells upon multiplicity of activities. Thus, a farmer by principal status is also an agricultural labourer by his subsidiary status work. At times, especially in the recent times, majority of the farmers combine agricultural and non-agricultural work to tide over the seasonality and fluctuations attached with the farm enterprise which effectively improves the resilience of the household. So, even a brief overview of the subsidiary occupations is relevant for a deeper understanding of the economy.

Table 10 : Subsidiary Occupation: Work Participation Before & After LA

		Before LA		After LA	
		N	%	N	%
Control	Non- worker	-	-	43	34.7
	Worker	-	-	81	65.3
	Total	-	-	124	100.0
Land lost	Non- worker	167	48.3	297	85.8
	Worker	179	51.7	49	14.2
	Total	346	100.0	346	100.0

Source: Primary Survey 2010- 11.

Table 11 : Subsidiary Occupation: Sectoral Change in Employment Before & After LA

Category of Households	Before			After					
	Primary	Secondary	Tertiary	Total	Non- worker	Primary	Secondary	Tertiary	Total
Households owning some land	N	-	-	-	-	54	8	9	71
	%	-	-	-	-	76.1	11.3	12.7	100.0
Control Pure tenants	N	-	-	-	-	8	2	0	10
	%	-	-	-	-	80.0	20.0	0.0	100.0
Total	N	-	-	-	-	62	10	9	81
	%	-	-	-	-	76.5	12.3	11.1	100.0
Households owning some land	N	114	10	15	139	113	5	9	139
	%	82.0	7.2	10.8	100.0	81.3	3.6	6.5	100.0
Land lost Pure tenants	N	29	7	2	38	32	2	1	38
	%	76.3	18.4	5.3	100.0	84.2	5.3	2.6	100.0
Total	N	143	17	17	177	145	7	10	177
	%	80.8	9.6	9.6	100.0	81.9	4.0	5.6	100.0

Source: Primary Survey 2010- 11.

Table 12 : Subsidiary Occupation: Change in the Nature of Work Before & After LA

Category of Households		Before					After			
		Casual Labourer	Self- employed	Regular salaried	Total	NA	Casual Labourer	Self- employed	Regular salaried	Total
Control	Households owning some land	N	-	-	-	-	10	60	1	71
		%	-	-	-	-	14.1	84.5	1.4	100.0
	Pure tenants	N	-	-	-	-	2	8	0	10
		%	-	-	-	-	20.0	80.0	0.0	100.0
	Total	N	-	-	-	-	12	68	1	81
		%	-	-	-	-	14.8	84.0	1.2	100.0
Land lost	Households owning some land	N	31	108	-	139	7	19	-	139
		%	22.3	77.7	-	100.0	5.0	13.7	-	100.0
	Pure tenants	N	13	25	-	38	3	3	-	38
		%	34.2	65.8	-	100.0	7.9	7.9	-	100.0
	Total	N	44	133	-	177	10	22	-	177
		%	24.9	75.1	-	100.0	5.6	12.4	-	100.0

Source: Primary Survey 2010- 11.

It may be noted that with respect to subsidiary occupation work participation have declined considerably in case of the land lost population from 51.7 to 14.2 per cent while the control samples have registered very high shares in the recent times (Table 10). The general trend has been a loss of work by 145 persons out of 177 (81.9 per cent) who have become non-worker after the land loss (Table 11). This has been the case with many workers who were directly or indirectly related to the family farm enterprises and lost work when land was acquired. The shares of workers involved with the primary sector have declined following land acquisition, but the decline has been less drastic compared to the trend observed in case of the principal occupation. The persistence of agriculture as a subsidiary status occupation has been partly on account of a switch-over of the status of agriculture from the principal means of sustenance to a truncated subsistence activity, and partly owing to shift of some of the

households towards dairy and kitchen gardening. There have not been alternative subsidiary occupations compensating for the primary sector work losses. Infact, in many cases the individuals have pursued their non-primary subsidiary occupations as their principal occupation after the land loss.

Nature of work of the subsidiary occupations have been dominated by self-employed for both the land owning as well as landless categories of households (Table 12). After land acquisition, a miniscule 13.7 per cent of the land owning and 7.9 per cent of pure tenant households continue as self-employed worker, about 5 per cent in casual labour and the remaining have lost subsidiary occupation whereas the control sample farmers continue to be largely self-employed in agriculture. Clearly, following land dispossession the rural economy lost the inherent balance that was ensured by the multiplicity of activities and eventually has become vulnerable.

(d) Occupational Mobility: The term occupation entails the exact description of one's work and hence articulates even the minute specificities attached to any type of work performed. It reveals the intricate nuances embedded in the specific occupation and far surpasses the information conveyed by the industrial categories of work although the latter has been commonly used by the practitioners in analysing the world of work. Further, the industrial classification merely clarifies whether the worker belongs to the primary, secondary or tertiary sector and fails to enlighten the exact nature of the job undertaken within that sector while it is well known that nature of work within any of these sectors vary from high end managerial enterprise to menial manual labouring types of work. Hence, an analysis of land dispossession induced occupational change is a worthwhile exercise even after an analysis of the employment structure because it would highlight the exact qualitative aspect of the nature of occupational transformation observed in the study area.

The first step towards identifying occupational mobility¹ has been to arrive at a hierarchical arrangement of the occupations reported by the respondents. The micro-studies have generally employed modes of payments and condition of work (AERC, 1988), nature of land rights and standard of living indicators (AERC various years) along with income and modal village wages (Pal et al, 2000), a combination of sector of work and the principal source of income (Swaminathan, 1991) as axes along which occupations have been ranked². While these criteria have been very effective in case of the specific micro-study, they have been extremely context-specific and generally lack universal applicability and may suffer from spatial comparability issues. The National Classification of Occupation (NCO) 2004 in India has been devised to obtain occupational categories that find international comparability as it follows the principles of the International Standard Classification of Occupations (ISCO)

1988³ brought out by the International Labour Organisation (ILO). It is based on two main concepts:

...the concept of kind of work performed in an occupation and the level of skill involved in the performance of the occupation [emphasis added]. Here it is emphasised that the focus in NCO-2004 is on the skill required to carry out the tasks and duties of an occupation and not on whether a worker holding a particular occupation is more or less skilled than another worker in the same occupation. In case of multi-skill occupations, the codification has been done on the basis of the pre-dominant skill requirement in the performance of the occupation (NCO, 2004; p.19- 20).

In this study the occupations of the respondents have been coded according to NCO 2004 schema to arrive at a hierarchical ordering⁴.

All the land lost households had been asked about their principal occupation before and after LA which have been presented in the form of a matrix in Table 13. It represents the percentage of persons in a particular occupation after land loss out of those who had been into that occupation prior to land acquisition. An increase in the share of workers in the region lying above or below the diagonal elements would denote shift in occupations and those lying along the diagonal indicate continuance with previous occupations.

It has been observed that except for the skilled agricultural and fishery worker category, all the occupations have remained considerably stable during the period between land acquisitions (Table 13). This category comprises primary sector workers who have been self-employed in farming in either ownership farms or tenanted holding and also those engaged into animal rearing for their households and excludes the manual worker in agriculture as well as non-agriculture. It may be noted that only 15 out of the 116, i.e, 12.9 per cent of the persons who were skilled agricultural workers are continuing

Table 13 : Change in the Occupation with Respect to the Principal Occupations of the Land Lost Households

Codes/Occupations	Occupations After Land Acquisition									Total
	0	1	2	3	5	6	7	8	9	
0 Non- worker	88.5 (184)	0.5 (1)	1.9 (4)	1.0 (2)	0.5 (1)	0.5 (1)	1.9 (4)	0.5 (1)	4.8 (10)	100.0 (208)
1 Legislators, Senior Officials and Managers	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
2 Professionals	0.0 (0)	0.0 (0)	75.0 (3)	0.0 (0)	0.0 (0)	25.0 (1)	0.0 (0)	0.0 (0)	0.0 (0)	100.0 (4)
3 Associate Professionals	25.0 (1)	0.0 (0)	25.0 (1)	50.0 (2)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	100.0 (4)
5 Service Workers and Shop & Market Sales Workers	25.0 (1)	0.0 (0)	50.0 (2)	0.0 (0)	0.0 (0)	0.0 (0)	25.0 (1)	0.0 (0)	0.0 (0)	100.0 (4)
6 Skilled Agricultural and Fishery Workers	17.2 (20)	1.7 (2)	12.1 (14)	2.6 (3)	7.8 (9)	12.9 (15)	15.5 (18)	1.7 (2)	28.4 (33)	100.0 (116)
7 Craft and Related Trades Workers	0 (0)	0.0 (0)	0.0 (0)	0 (0)	0 (0)	0 (0)	100.0 (2)	0 (0)	0 (0)	100.0 (2)
8 Plant and Machine Operators and Assembler	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
9 Elementary Occupations	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	100.0 (6)	100.0 (6)
Total	59.9 (206)	0.9 (3)	7.0 (24)	2.0 (7)	2.9 (10)	4.9 (17)	7.3 (25)	0.9 (3)	14.2 (49)	100.0 (344)

Source: Primary Survey 2010- 11. Figures in parentheses indicate number of observations.

with the same occupation and the rest are dispersed into other occupations. People engaged in the other occupations accounting for a miniscule number of workers have broadly remained stable during the period between land acquisitions thereby denoting that the loss of access to land have been the chief trigger to the de-stabilisation of the skilled agricultural workers. The bulk of the skilled agricultural and fishery workers (28.4 per cent) have shifted to the category of elementary occupations entailing manual labour which has been the lowest occupation type in the hierarchy. Another

15.5 per cent have shifted to craft related trade workers that comprise occupations like mason, tailor, mechanics of various kinds and carpenters. Only 12.1 per cent have moved to professional occupations consisting of business enterprises and 7.8 per cent to service workers and shop and market sales workers from among the skilled cultivators. It may be observed that out of the 208 non-workers before land loss, only 24 of them, ie, 11.5 per cent have become economically active. While decline of traditional occupations and immigration have been cited as reasons causing shift towards manual labour

(Swaminathan, 1991), in this study region dispossession of the peasantry has been the secular reason leading to the pattern of occupational transition experienced by the cultivators.

In order to identify the exact nature of occupational mobility experienced by the workers hailing from land dispossessed households, the nine divisions of the NCO-2004 occupations have been clubbed according to the relevant four skill levels⁵. This analysis pertains to those who have been working both before and after LA and excludes those who have non-worker status in any time period. Three types of mobility have been identified: (i) no change where the individual have been continuing with the occupation they had been engaged into prior to LA, (ii) downward mobility where individuals have shifted to occupations that rank

lower compared to their occupation before LA, and, (iii) upward mobility where the individuals have improved their occupational rank.

Attempting to look into the direction of occupation change, it may be observed that 55 out of the 114 persons (48.2 per cent) who were employed both before and after land acquisition have experienced downward occupational mobility (Table 14) and about one-third of them have exhibited upward mobility, the rest continuing with their previous occupations. The nature of land dispossession experience has some impact upon the type of mobility attained by the farmers. There has been considerable variation in the pattern of occupational mobility experienced between those who have completely lost all land and those who have lost part of the land they owned before land acquisition. While, about 40 per cent

Table 14 : Principal Occupation: Nature of Occupational Mobility Following LA

Category of household			Nature of change			Total
			No change	Downward movement	Upward movement	
Partially lost land	Households owning some land	N	15	15	10	40
		%	37.5	37.5	25.0	100.0
	Pure tenants	N	4	2	1	7
		%	57.1	28.6	14.3	100.0
	Total	N	19	17	11	47
		%	40.4	36.2	23.4	100.0
Completely lost land	Households owning some land	N	5	28	19	52
		%	9.6	53.8	36.5	100.0
	Pure tenants	N	4	10	1	15
		%	26.7	66.7	6.7	100.0
	Total	N	9	38	20	67
		%	13.4	56.7	29.9	100.0
All land lost	Households owning some land	N	20	43	29	92
		%	21.7	46.7	31.5	100.0
	Pure tenants	N	8	12	2	22
		%	36.4	54.5	9.1	100.0
	Total	N	28	55	31	114
		%	24.6	48.2	27.2	100.0

Source: Primary Survey 2010- 11.

of the partially land lost households have been continuing with their previous occupations, this has been the case with only 13.4 per cent of the households who have completely lost land. Also, the propensity to experience downward occupational mobility has been considerably higher for those who have completely lost all land relative to those who have partially lost land. Such a phenomenon perhaps indicates that land continues to be the chief economic base to which the people persistently remain attached and draw sustenance till they completely lose access. Further, it suggests that households who have completely lost land have been thrust into a situation where they have been offered with very little opportunity for livelihood provisioning post-land dispossession and that they have been compelled to undertake whatever job was available. Hence, the completely land lost people have been placed more precariously following land dispossession.

Although only 27.2 per cent of the individuals have experienced upward occupational mobility, the pure tenant households have been grossly left out of this upward mobility. While 31.5 per cent of the land owning households have moved upward, this figure is only 9.1 per cent (2 out of 22 persons) for the pure tenant households. The downward mobility has been high irrespective of land owned (46.7 per cent) or not owned (54.5 per cent). Such a pattern although confuses the association between access to land and livelihood outcome, a positive albeit weak connection between the two may be construed.

The most widely accepted factor leading to improvement in livelihoods has been level of human capital development. Educational attainment as well as skill levels of the individuals has been assumed to be the chief determinant of how well any individual would negotiate with any kind of change in the economy. A positive causal link between them has been extensively estimated (Chadha & Sahu, 2002; Kundu et al,

2005). Table 15 indicates that among the land owning households, although majority have been secondary educated (about 50 per cent) irrespective of experiencing upward or downward mobility, 31 per cent of upward mobile persons have been higher secondary and above educated. Overall 80 per cent of the upward mobile persons have had education above secondary level which for the downward mobile persons has been around 55 per cent. Among the landless, there has not been any notable link between educational attainment and occupational mobility.

Skill attainment has also been very poor among the respondents and has not displayed any remarkable impact upon the nature of occupational mobility. More than 50 per cent of both upward and downward mobile individuals hailing from both landed and landless households have no training. In fact, 28 per cent of the downward mobile land owning persons have been noted with non-formal vocational training against 10.3 per cent for the upward mobile persons. Such a peculiar pattern does reveal that the jobs that have emerged in the region do not match the vocational skill endowment of the land acquisition affected individuals and that the majority of them have experienced downgrading of occupational status leading to deterioration of their social status.

Policy Implications and Concluding Remarks

The study has clearly indicated that there has been shift of the agriculturalists towards tertiary sector work in the form of business enterprise in case of the landed households and shift towards secondary sector mainly consisting of construction activities at the project site in case of the pure tenants following land dispossession. While larger shares of the landed households have been able to continue being self-employed, the pure tenants have experienced increase in casual type of work. Further, the higher propensity of the pure tenant households to experience downward occupational mobility relative to the landed

Table 15 : Comparison of Educational Attainment & Skill Levels Between Upward & Downward Occupational Mobility Categories

Occupational Categories	Educational Attainment					Skill levels				Total
	No formal schooling	Primary education	Secondary education	HS & above	Total training	No vocational training	Non-formal vocational	Formal vocational	Technical	
Downward mobility	N 6 % 14.0	13 30.2	22 51.2	2 4.7	43 100.0	26 60.5	12 27.9	5 11.6	0 0.0	43 100.0
Upward mobility	N 2 % 6.9	3 10.3	15 51.7	9 31.0	29 100.0	20 69.0	3 10.3	5 17.2	1 3.4	29 100.0
Total	N 8 % 11.1	16 22.2	37 51.4	11 15.3	72 100.0	46 63.9	15 20.8	10 13.9	1 1.4	72 100.0
Pure tenants										
Downward mobility	N 6 % 50.0	1 8.3	5 41.7	0 0.0	12 100.0	6 50.0	3 25.0	3 25.0	0 0.0	12 100.0
Upward mobility	N 0 % 0.0	0 0.0	1 50.0	1 50.0	2 100.0	1 50.0	0 0.0	1 50.0	0 0.0	2 100.0
Total	N 6 % 42.9	1 7.1	6 42.9	1 7.1	14 100.0	7 50.0	3 21.4	4 28.6	0 0.0	14 100.0

Source: Primary Survey 2010-11.

gentry reiterates the advantageous position of the latter under any circumstance of land loss compared to the former owing to their entitlement for receipt of cash compensation. It clearly indicates the need for intervention to safeguard the interests of the most vulnerable groups that is the landless agricultural workers. Inclusion of the landless agricultural workers like agricultural labourers and tenant farmers within the compensation net would ensure some cash receipt in lieu of land and livelihood loss. Perhaps formalisation of tenancy prior to land acquisition would facilitate the compensation disbursement process.

Improvement in the status of human capital has been widely acknowledged as the second route to compensating livelihood loss. However, in this study area, although education has displayed some weak positive relation with upward occupational mobility, skill endowment has remained far from having any such association. Perhaps the most intriguing finding relates to this issue of mismatch between skill attainments of the individuals and the nature of occupational mobility experienced by them. It suggests that the emergent types of activities have not been in consonance with the stock of skill available to the land dispossessed people. The relative asset poverty of the vulnerable sections perhaps may be addressed through

targeted provisioning of education and skill training. However, at this juncture it is important to note that capacity building alone would be inadequate if it does not economically rehabilitate the displaced persons. As observed in this study, the mismatch between skill levels of the land dispossessed households and the emergent types of jobs lead to deterioration of their lives. Hence, the training imparted must be in accordance to that demanded by the emerging jobs in the vicinity of the land acquisition site so that the displaced persons get absorbed easily into the urban-based economic activities.

The hitherto self-contained peasantry has been thrust into a condition of imperfect proletarianisation by the state perpetrated institutionalised land alienation whereby they have been compelled incessantly to struggle to forage a living wage. The construction industry at the urban project sites has emerged as by far the leading alternate employment provider that exudes transient nature of the employment. Yet the majority of the land dispossessed has been left with not many options but to join the army of casual wage labourers. It prompts one to question the route to urbanisation-industrialisation embarked upon by the Government that unambiguously impoverishes the peasantry and triggers a peculiar type of rural transformation that promises adversity.

Notes

1. The study although have identified both the principal as well as subsidiary occupations of the respondents, the latter part of the analysis on correlates of occupational mobility has been based upon the principal occupation only.
2. There have been manifold ways in which scholars have arrived at the hierarchy of occupations. For a comprehensive review of the available literature on this issue see pal et al, 2000.
3. This has been the most recent.
4. The ISCO-88 skill levels have been modified to suit the Indian conditions before codifying the occupations in the NCO-2004 particularly to accommodate for informal skills which constitute a very significant share of training and skill acquisition through generations.

The NCO 2004 scheme does not include the non-workers and denotes armed forces by the code zero. However, the non-worker category indicated in the occupation matrix has not been a

part of the hierarchy as it is not possible to judge whether all the non-workers have been enjoying higher or lower economic status compared to the workers of any of the occupational categories.

5. The schema of NCO code and the relevant skill level has been presented below:

Skill Levels in NCO 2004

Division/ Codes	Title	Skill level	Definition of NCO 2004 skill levels
1	Legislators, Senior Officials and Managers	Skill not defined	The concept of skill level has not been applied as skills for executing task and duties of these occupations vary to such an extent that it would be impossible to link them with any of the four broad skill levels.
2	Professionals	IV	More than 15 years of formal education
3	Associate Professionals	III	14-15 years of formal education
4	Clerks	III	
5	Service Workers and Shop & Market Sales Workers	II	11-13 years of formal education
6	Skilled Agricultural and Fishery Workers	II	
7	Craft and Related Trades Workers	II	
8	Plant and Machine Operators and Assemblers	II	
9	Elementary Occupations	I	Up to 10 years of formal education and/ or informal skill

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PANCHAYATI RAJ INSTITUTIONS IN JAMMU AND KASHMIR: A CRITICAL ANALYSIS

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ABSTRACT

Panchayats as traditional institutions were seen in India as almost sacred with their Panchas (members) referred to as 'Panch Parmeshwar' (member as God) with expectations of fairness and justice in their role of settlement of local inter-personal and community disputes. The genesis of the new panchayats can be traced to the attempts made in colonial India. The State of Jammu and Kashmir (J&K) has its own unique history as far as Panchayati Raj is concerned. In Jammu and Kashmir, the Panchayati Raj Institutions are established under the Jammu & Kashmir Panchayati Raj Act, 1989. However, the provisions of 73rd Amendment Act were not extended to the State owing to the special status of Jammu and Kashmir under Article 370. Although the State Government has adopted various provisions of 73rd Amendment Act, the Jammu & Kashmir Panchayati Raj Act, 1989 has many loopholes.

Introduction

The Panchayati Raj is an indigenous and time-honoured concept in our country. The form may vary, but the spirit has always been part of our socio-cultural ethos. Its origin can be traced back to ancient ages where community spirit was the main force not only to keep village communities united but to help them manage local affairs independently. Sir Charles Metcalfe characterised them as small "republics having nearly everything that they want within themselves" (Aslam 1996).

The genesis of the new panchayats can be traced to the attempts made in colonial India with the panchayat laws enacted in the provinces and princely states in 1920 and thereafter. These laws sought to create panchayats as local bodies dealing with sanitation, regulation and maintenance of buildings, roads, etc., and to be endowed with judicial powers for settlement of

petty disputes. The next stage of legislative action about panchayats was in 1940s when the Congress governments elected in the provinces under the Government of India Act 1935 legislated for more broad-based panchayats (Buch 2010).

It is, however, in Independent India that we see panchayats in their present incarnation as local bodies with substantial development orientation. Article 40 of the Constitution of India provides that the State shall take steps to organise village panchayats and endow them with such powers and authority to enable them to function as units of local self-government. The two milestones in the evolution of Panchayati Raj Institutions (PRIs) were the reports of two Committees set up by the Central government in 1957 and 1978, namely, the B.R. Mehta Committee of 1957 and the Asoka Mehta Committee of 1978.

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However, even after the recommendations of the Balwant Ray Mehta Committee and Asoka Mehta Committee on panchayats had been put into force, several ills continued to afflict the Panchayati Raj system in the country in the post-Independence period. There were long delays in holding of panchayat elections, frequent suspension/supersession/dissolution of the panchayat bodies, lack of functional and financial autonomy, inadequate representation of marginalised and weaker sections and meagre and occasional government grants. This crippled the functioning of panchayats and did not allow them to function as institutions of local self-government as envisaged in the Constitution.

Thus an imperative need has accordingly emerged to enshrine in the Constitution of India, certain basic and essential features of local self-government so as to enable local bodies to function as institutions of self-governance both in planning and implementation of development programmes. Consequently, Constitution (73rd Amendment) Act, 1992 was passed and was brought into force with effect from 24 April 1993. The passage of the 73rd Constitution Amendment Act, 1992 marks a new era in the federal democratic set-up of the country and provides Constitutional status to the PRIs.

The main features of the Act are –

- a three-tier system of Panchayati Raj for all States having a population of over 20 lakh;
- panchayat elections are to be held regularly every five years;
- reservation of seats for Scheduled Castes (SCs), Scheduled Tribes (STs) and women;
- constitution of an independent State Election Commission to hold panchayat elections on a regular basis;
- appointment of an independent State Finance Commission to make recommendations as regards the financial resources of the panchayats;

- legal status to Gram Sabhas; and
- inclusion of Eleventh Schedule to the Constitution listing 29 Subjects within the jurisdiction of PRIs.

Panchayati Raj in Jammu and Kashmir

The State of Jammu and Kashmir (J & K) has its own unique history as far as Panchayati Raj is concerned. The political crisis that has been occupying it for a long time now has not allowed any positive social reconstruction projects to go smoothly in a planned direction. The vision of grassroots empowerment in J & K emerged as part of the national movement that took the shape of an organised mass movement since 1931. It was under the pressure of this popular movement that the Maharaja's government initiated a series of reforms. It promulgated the J & K Village Panchayat Regulation Act No. 1 in 1935.

The National Conference that spearheaded the freedom movement in the valley provided for the institutional arrangement for grassroots empowerment in its party agenda 'New Kashmir Manifesto' adopted by the party in 1944. The National Conference came to power in March 1948. At that point of time, the development scenario of the State was characterised by economic stagnation and educational backwardness. The Zamindars had accumulated large chunks of land through manipulation. The majority of the people were impoverished. In view of this situation, abolition of landlordism became the top priority of the Government. It resulted in the introduction of Big Landed Estates Abolition Act, 1950. This was a landmark in the history of J & K as it was the first experiment of its kind in land reforms in the sub-continent. It provided a sound base for reactivation of the Panchayati Raj system in reshaping the rural economy in the State (Aslam 1977).

Realising this, the Government replaced the Panchayat Act of 1935 (as amended in 1941)

with Act-V of Samvat 2008 (corresponding to year 1951). The main features of this Act were:

- Majority of the panchayat members were to be elected on the basis of adult franchise;
- Panchayats were to perform administrative, developmental, civic and judicial functions;
- Introduction of concept of Halqa Panchayat comprising 5-7 villages;
- Introduction of Panchayat Board at each Tehsil (Mohammad 1995).

On the one hand, the Government was busy materialising the objectives set for democratic decentralisation through Panchayati Raj and the State Government joined rest of the country in introducing Community Development Programme throughout the State in 1952 on the other. Though local self-government entered a long period of dormancy after dismissal of Sheikh Abdullah government in 1953, the Constitution of the State that was adopted in 1957 reiterated the commitment to the establishment of the Panchayati Raj.

The introduction of Community Development Programme (CDP) and the National Extension Services (NES) occupied the full attention of the Central and the State Governments during the 1950s. Towards the end of the decade, it was realised that the expectations raised by these programmes were not getting fulfilled, and that one of the main reasons was lack of people's participation in the planning and execution of these development schemes. At the national level, it was the Study Team on Community Development Projects and National Extension Services headed by Balwant Ray Mehta (1957) which expressed concern about the lack of people's participation and made a strong plea for devolution of power to lower levels through Panchayats.

Before the Panchayati Raj system could be introduced in the whole country, the J & K State took a lead by passing 'the Jammu and

Kashmir Village Panchayat Act of 1958', and repealed its earlier Acts. This Act of 1958 did not however differ much from 1951 Act.

The panchayats as local institutions of self-government remained dysfunctional over a long period of time. Wherever they existed, they were at the village level only without any functional linkages with the developmental institutional structures that existed at the block and district levels. It took almost two decades for the State Government to realise that without people's participation, the developmental process could not achieve desired objectives. The decentralisation of planning process was new and upcoming developmental slogan at that point of time. The State Government took a bold step by introducing an innovative concept of 'Single Line Administration' to secure participation of the people through their representatives in the developmental process. "The twin objectives of the Single Line Administration was to secure a mechanism for developing the planning process at the district level to take full account of the resource endowments, the potentialities and structural needs and also to initiate a process of equitable development of various areas within the district" (Choudhary 1990).

However, the implementation of this innovative model led to the realisation that "human potential which is available at the grassroots level should be mainstreamed into the movement of development to provide a sound and strong basis to the democratic structure. It was in this context that the desire to have a sound institutional framework to give a definite and positive role to the community in the matter of self-governance has provided a sense of urgency for restructuring the institutional framework of Panchayati Raj" (Choudhary 1990). This realisation led to the introduction of Jammu and Kashmir Panchayati Raj Act, 1989.

The Jammu & Kashmir Panchayati Raj Act, 1989

The Jammu & Kashmir Panchayati Raj Act, 1989 was passed in March 1989. The Governor gave his assent to the bill in July 1989. For the first time an Act was named a "Panchayati Raj Act" rather than as "Village Panchayat Regulation Act". The former implies the promotion of Panchayati Raj in the State (at village, block and district levels) whereas the latter was confined to panchayats at the village level alone. This is certainly a very positive development.

Three-Tier Model: The Act provides for a three-tier system consisting of:

- Halqa Panchayat
- Block Development Council and
- District Planning and Development Board.

In addition, the Act provides for a Panchayati Adalat for every Halqa.

Halqa Panchayat : The Halqa Panchayat comprises such number of panches not less than seven and not more than eleven including the Sarpanch as the prescribed authority may fix from time to time. The panches are elected from the constituencies delimited by the prescribed authority. While the naib-sarpanch is elected by the panches of the Halqa Panchayat from among themselves, the sarpanch is elected directly by the electorate of the Halqa Panchayat. The Halqa Panchayat continues to function for a period of five years from the date of its constitution. If it is dissolved for any reason before this period, elections will be held within six months. A sarpanch or naib-sarpanch can be removed by a vote of no-confidence passed by a majority of not less than two-thirds of the total number of panches of the Halqa Panchayat.

The other features of the Act in respect of Halqa Panchayats include:

- If the prescribed authority is of the opinion that women are not adequately represented

in the Halqa Panchayat, it may nominate such number of women to be members thereof, as it may deem fit. Provided further that their number does not exceed 33 per cent of the total number of panches.

- The Village Level Worker (VLW) shall be the secretary of the Halqa Panchayat.
- If, in the opinion of the Government, a Halqa Panchayat is incompetent or persistently makes default in the performance of duties imposed on it by or under the Act, the Government may by notification supersede such a Halqa Panchayat.

The Act provides for various powers and functions to the Halqa Panchayat which enables it to become the cutting edge of all the development efforts, but all this is subject to availability of funds at its disposal. The important powers and functions allocated to Halqa Panchayats as enshrined in the Act are:

- to prepare and implement the plans for the development of the Halqa ;
- preparation and implementation of special developmental plans for alleviating poverty and employment generation;
- the Halqa Panchayat shall be involved in the implementation of scheme of universalisation of elementary education and other educational programmes;
- the Halqa Panchayat shall also perform such other functions and duties as may be assigned or entrusted to it by the Government, the District Planning and Development Board and the Block Development Council within the area of which Halqa Panchayat is located.

Block Development Council: The Act provides for the constitution of a Block Development Council consisting of:

- a chairperson,
- all sarpanches of Halqa Panchayats falling within the block, and

- Chairpersons of marketing societies within the jurisdiction of the block.

However, if the prescribed authority is satisfied that women or scheduled castes or any other class are not represented in the Council, it may nominate not more than two persons to be the members of the Block Development Council. The Block Development Officer is the secretary of the Block Development Council. The chairperson of Block Development Council will be a person who is qualified to be elected as a Panch. Every Block Development Council also has a vice-chairperson who is elected by the members of the Block Development Council from amongst themselves.

The main functions of the Block Development Council are:

- construction, maintenance and supervision of inter-Halqa Panchayat communication system ;
- administrative and technical guidance to Halqa Panchayats and review of their work ;
- to supervise plans relating to agriculture, rural development, animal husbandry/sheep husbandry, social forestry, education and public health ;
- to supervise and monitor the implementation of poverty alleviation programmes;
- to carry out such other functions as may be entrusted to it by the Government or by the District Planning and Development Board.

District Planning and Development Board : Further, the Act provides for the constitution of a District Planning and Development Board (DPDB) comprising:

- Chairpersons of the Block Councils of the District;
- Members of Parliament representing the area;

- Members of the State legislature representing the area;
- Chairpersons of the Town Area Committees of the District; and
- President of the Municipal Council (if any)

The chairperson of the DPDB is nominated by the Government from amongst the members of the DPDB. The vice-chairperson is elected by the members from amongst themselves. The District Development Commissioner is the Chief Executive of the Board to be assisted by district level heads.

The main functions of the DPDB are:

- to consider and guide the formulation of development programmes for the district and indicate priorities for various schemes and consider issues relating to the speedy development and economic upliftment of the district ;
- to review periodically progress and achievements of development plans and schemes and make recommendations as it considers appropriate ;
- to function as a working group for formulation of periodic and annual plans for the district;
- to formulate and finalise the plan and non-plan budget for the district ;
- to lay down the policy guidelines for the Block Development Councils and Halqa Panchayats;
- to approve the budget of the Block Development Council and supervise and coordinate their work ;
- to undertake special measures for alleviating poverty and employment generation and extending assistance to Halqa Panchayats in this behalf ;
- to promote and assist cooperative institutions;
- to perform such other functions and duties as may be assigned or entrusted to it by the government from time to time.

All the development assistance meant for the development of the district flows through the District Planning and Development Board. The DPDB has to set up committees to handle specialised jobs. The number and manner in which they shall be constituted are decided by the DPDB.

Panchayati Adalat: Panchayati Adalat is another important feature of Jammu & Kashmir Panchayati Raj Act. The idea of Panchayati Adalat is an innovative one, particularly at the grassroots level. As per the provisions of the Act, the Adalat shall comprise five members to be nominated by the government out of the panel prepared and recommended by the Halqa Panchayat out of its electorate. The person so recommended for a term of five years shall be literate, shall have attained the age of 30 years, not be a sarpanch or a panch and not be in the employment of the government or local body or corporation. The members of a Panchayati Adalat shall elect any member from amongst themselves as the chairperson. The secretary of the Halqa Panchayat shall serve as the judicial clerk to the Panchayati Adalat. The Panchayati Adalat shall not be competent to impose on any person convicted of an offence tried by it, any sentence other than a sentence of fine not exceeding one thousand rupees.

Limitations of the Jammu and Kashmir Panchayati Raj Act, 1989

The Jammu & Kashmir Panchayati Raj Act of 1989 cannot in any way claim to decentralise power or create a democratic environment at the grassroots level. One of the most serious flaws in the Act relates to government intervention in the composition of panchayats. Unlike the 73rd Amendment to the Constitution that provides that all the seats in the panchayats shall be filled by persons chosen by direct election from territorial constituencies in the panchayats, this Act provides for nominations at every level – the Halqa Panchayat, the Block Development Council and the District Planning and Development Board.

The principle of direct election of panchayats is applied only at the village level. Neither the Block Development Council nor the District Planning and Development Board comprise directly elected representatives of the people. It is only the chairman of the Block Development Council who is elected but the mode of election is indirect i.e., the electoral college comprised the panches and sarpanches within that block. Similarly, there is no provision for direct election to the District Planning and Development Board. It is only the vice-chairperson of the Board who is elected, the electoral college comprises the members of the Board itself.

Provision for nomination was aimed at compensating for another critical flaw of the Act – its inability to provide for reservation of seats for women, scheduled castes and the scheduled tribes (SCs/STs). Unlike the 73rd Amendment of the Constitution which provides for reservation of 33 per cent seats for women through direct election, the State Act empowers the government to nominate women to the panchayats if it feels that their representation is needed.

Panchayati Adalats have been used in many States to supplement the formal judicial system by reviving and legitimising the traditional system of justice. Union Government has also passed Gram Nyayalyas Act recently to provide justice at grassroots level. But by empowering the State Government to nominate the members of the Panchayati Adalat, and to remove its chairperson or any member, the State law robs independence of the institution of justice at the grassroots level. It amounts to supplementing the judicial system and the traditional system of justice, both supposed to be independent of the executive, by a third sector of justice controlled by the State government.

The principle of nomination not merely goes against the democratic nature of panchayats but also changes the nature of rights

enjoyed by the nominated members of the panchayats. The representation of nominated members is at the discretion of the State Government and not a Constitutional right for any of these groups. In fact, the discretion can easily be used by the government to influence the autonomous working of panchayats.

Nomination or co-option has two consequences. Firstly, this meant presence of only token women and nomination by the dominant party already in power meant selection of pliant or kinswomen. Secondly, the political parties and ruling party groups interested in controlling panchayats ensure that women did not contest even if some of them express interest, so that they could bring their 'own women' later through nomination after getting only male candidates elected. Thus, co-option was not only based on a view of women as a weaker and incapable of contesting elections, it also became an instrument of patronage for the dominant political or social groups who act to retard progress in women's representation in election.

A study on panchayats in Maharashtra in 1983 recorded, "A respondent, who was ambitious and had successfully contested previous election, said that her party had prevailed upon her during the last Zilla Panchayat (ZP) election, not to stand for elections because her winning the election would deprive the party of an extra seat in ZP as well as the Panchayat Samiti. In case a woman contestant is elected, there is no room for co-option and the co-opted member enjoys the same privileges of voting as elected members. Political parties, therefore, utilise the statute regarding co-option as a means of gaining votes and strengthening their party position in the panchayat body and not for promoting effective representation of active women" (D'Lima 1983).

In order to deal with these limitations of 1989 Act, the State Government has adopted many positive features of 73rd Amendment Act

over the years. The various important changes made in the original Panchayati Raj Act of 1989 are:

Halqa Majlis : Halqa Majlis is the equivalent of Gram Sabha in Jammu and Kashmir. Earlier the provision of Halqa Majlis was not prescribed in the Act. But its provision was made in the Jammu and Kashmir Panchayati Raj Rules, 1996. It has been prescribed that every Halqa Panchayat shall have Halqa Majlis comprising all the persons whose names are included in the electoral roll for such Halqa Panchayat. The sarpanch has to convene at least two meetings of Halqa Majlis during a financial year.

Every Halqa Panchayat need to prepare and lay for sanction before the Halqa Majlis the budget estimates of income and expenditure for the year commencing on 1st day of April, of Halqa Panchayat incorporating therein future developmental programmes and plans for the relevant year. At least 20 days notice shall be given for calling a meeting of Halqa Majlis. Any voter present in the Halqa Majlis may also raise any matter of public importance which shall be discussed and shall be accepted or rejected by a majority vote and the budget shall be recast accordingly.

Provision for Reservation : The J & K Panchayati Raj (Second Amendment) Act, 2003 was solely passed with the objective to strengthen the representative character of the Halqa Panchayats, and also to ensure effective participation of women and scheduled castes/scheduled tribes (SCs/STs) in the functioning of grassroot level democratic institutions. State government agreed to adopt this important provision of 73rd Amendment -although partially as only panch seats are reserved- because representation of women in panchayats that set up after 2001 elections was very less. In 2001 panchayat elections out of the 1230 sarpanch and 10090 panch constituencies in Jammu Division only 166 women panch and 7 sarpanch were able to win elections. It means that the representation

of women candidates elected is quite dismal, ranging from 0.5 per cent in respect of sarpanch to 1.70 per cent in respect of panch positions.

The statute provides that the Panch seats shall be reserved for the scheduled castes and the scheduled tribes in every Halqa Panchayat in proportion to their population in rotation to different constituencies in such manner and by such authority as may be prescribed. Provided further that not less than one-third of the total number of panch seats reserved under this arrangement shall be reserved for women belonging to the scheduled castes or, as the case may be, the scheduled tribes, and not less than one-third of the total number of seats to be filled by direct election in every panchayat shall be reserved for women (See Govt. of Jammu and Kashmir, Civil Sect., Rural Development Department, Notification, Srinagar, the 18th June, 2004).

This amendment does not talk about reservation of seats for the post of sarpanch, which seems to be a flaw and retrograde step as it is sarpanch and his/her able guidance that leads to the success of panchayat and development of the village.

State Election Commission : The absence of provision for State Election Commission in the Jammu and Kashmir Panchayat Act was one of the main lacunae of the Act. In 2011, the J & K government however decided to amend the Act and thereby provision for State Election Commission was made. State Election Commission was entrusted with the responsibility of superintendence, direction and control of the preparation of electoral rolls for and the conduct of, all elections under panchayat Act.

State Finance Commission : A pre-requisite of the success of the Panchayati Raj system is its financial viability and autonomy. The 73rd Amendment to the Constitution provides for appointment of a Finance Commission by the State Governments to make recommendations for

- determination of the taxes, duties, tolls and fees which may be assigned to panchayats;
- distribution between the State and panchayats of the net proceeds of taxes, duties, etc;
- grant-in-aid to the panchayats by the States.

The J & K Panchayati Raj Act neither fixes minimum amount of grant-in-aid by the State to the panchayats nor provides for an autonomous machinery for objective allocation of funds. Due to political and public pressure, the State government agreed to create the State Finance Commission by bringing in a separate bill in 2011. The Jammu and Kashmir State Finance Commission for Panchayats and Municipalities Act, 2011 was passed accordingly.

This Act provides that the Government shall, as soon as may be from the commencement of the Act, and thereafter at the expiration of every fifth year, constitute a "State Finance Commission for Panchayats and Municipalities" to review the financial position of panchayats and municipalities and to exercise the powers conferred upon and to perform the functions assigned to it, under the Act (The Jammu and Kashmir State Finance Commission for Panchayats and Municipalities Act 2011).

The main functions of Commission regarding panchayats are-

- the distribution between the State and the panchayats of the net proceeds of the taxes, duties, tolls and fees leviable by the State;
- the determination of taxes, duties, tolls and fees which may be assigned to, or appropriated by, the panchayats;
- the grants-in-aid to the panchayats from the Consolidated Fund of the State;
- the measures needed to improve the financial position of the panchayats.

Panchayat Elections in 2011

The panchayat elections in Jammu and Kashmir were announced after a gap of 10 years,

and the process began in early 2011. The last panchayat elections were conducted in the State in 2001-02 after a gap of 23 years.

The panchayat elections were held in 16 phases starting from April 13 to June 18 for the election of 4130 sarpanches—2164 in Kashmir and 1966 in Jammu, and 29,719 panches—15,959 in Kashmir and 13,760 in Jammu. About 29,000 polling stations were set up for conducting these elections, and more than 50 lakh people were eligible to cast their votes in these elections. These panchayat elections created great enthusiasm among rural masses. They have shown great interest and participated vigorously in these panchayat elections. Over 79 per cent of the electorate exercised their right to vote.

These elections were very important because for the first time reservation was provided to women and SCs/STs in panch seats. Due to reservation out of 28248 panchs elected across the State, 9424 are women i.e., 33.3 per cent of elected panches are women. But in case of sarpanch posts, the fairer sex in Jammu and Kashmir has failed to break into male-dominated politics of the State. Out of 4,113 sarpanch posts in the 22 districts of the State, only 28 women managed to win the elections- a dismal success rate of 0.68 per cent. It is because of the fact that there was no reservation for women in sarpanch constituencies.

Conclusion

The Panchayati Raj Institutions in Jammu and Kashmir State continue to suffer both from structural as well as operational weaknesses. Structurally, the Panchayati Raj Act 1989, despite the recent amendments (including the 2004 amendment in relation to reservation; 2011 amendment to provide for the State Election Commission and; more recently passed Act in relation to the State Finance Commission), remain flawed and do not serve the purpose of making the panchayats the units of self-governance.

Due to lack of Constitutional guarantee to PRIs, there is a degree of arbitrariness in the constitution of panchayats in the State. Due to this fact, although the Act provides for the continuity of panchayats by mandating that before the expiry of the term of panchayats, the next elections are to be conducted, the government may ignore this provision and may not conduct the elections before the expiry of the term of panchayats. Since 2006, for five years, there was a vacuum with no elected panchayats in place.

In another manner also, the arbitrariness is clearly reflected. Though the Act provides for the three tiers of panchayat, the government while holding the elections for the village panchayats, was not under any obligation to constitute the Block Development Councils (BDCs) and District Planning and Development Boards (DPDB) immediately. The BDCs and DPDBs, therefore, were not constituted in 2001-2006 period and almost two and half years have passed since the last panchayat elections were held but BDCs and DPDBs are still to be constituted.

At the operational level, the biggest issue remains the absence of powers for the panchayats. From 2001 to 2006, though the Halqa Panchayats were the only democratically-constituted layer of panchayats, these were not empowered. If panchayats remained functional, these were only in relation to the Centrally-sponsored schemes for which it was mandatory that the panchayats be involved. If there was anything more pathetic than the lack of powers for the panchayats, it was the absence of funding. Again, the only funding that was available to the panchayat was the funds of some Centrally-sponsored schemes. Except this, neither the panchayats were provided basic funding by the State nor were these directed to raise their own resources.

This scenario, more or less, remains the same even after the 2011 elections. There are

pronouncements regarding devolution of powers and empowerment of panchayats like 22 September, 2011 General Administration (GAD) Order mentioning devolution of functions of 14 departments to PRIs, and yet, the panchayats remain powerless.

Similarly, when the provision for Halqa Majlis (Gram Sabha) was incorporated in the Act, the powers of the Gram Sabha were not detailed.

Gram Sabha which should have been the most powerful body demanding accountability from the panches and sarpanches, remains subordinated to the panchayats. Thus, the present status of Panchayati Raj Institutions demands serious interventions from the higher government for their empowerment. The State Government must move towards adopting the key provisions of 73rd Constitution Amendment in this regard.

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IMPACT OF ECOLOGICAL AND ECONOMIC FACTORS ON RICE FARMING: A CASE STUDY OF KANYAKUMARI DISTRICT

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ABSTRACT

Farming, particularly rice farming is adversely affected by unfavourable changes that happened in ecological and economic conditions of a region. Kanyakumari district is not an exception to this. Rice is the staple food of people of the district. The district was once called 'the Rice Granary' of erstwhile Travancore State. However, the present situation is completely different. Per year decline in the area under rice cultivation is 532.76 hectares between 1957-'58 and 1991-'92 and 1328.80 hectares between 1999-'00 and 2008-'09. If this tendency continues, there will be no rice cultivation in the district after 2025. Ecological factors make the income from rice farming uncertain and economic factors make rice cultivation non-profitable. So farmers quit rice cultivation; already 62 per cent quitted rice farming and 60 per cent of the remaining are ready to quit.

Introduction

Rice farming is much affected not only by ecological factors but also by economic factors. Ecological factors like changes in climate i.e., rainfall, temperature and wind direction and speed, soil quality, water quality, intensity of light and moisture content in the atmosphere, rainfall and temperature are the most influencing factors. Hence, it is reported that climate change influences every economy by delayed monsoon, unexpected rains, heavy downpours and rising temperature {Cramer (2008) Dar (2009) Joseph (2009) Krugman (2009) Middletonne (2009) Monbiot (2009) Panda (2009) Sample (2009) Sanwal (2008)}. Factors such as net return, cost of input, price of output, availability of farm labourers and finance and marketability of

produce are the main economic factors influencing the area under rice cultivation and thereby the production of rice.

In Kanyakumari district also these factors play a key role in deciding the cultivation of rice which is the staple food of people of the district. This article is prepared to estimate the impact of rainfall and temperature on the area under rice cultivation and productivity and the consequent effect on production and to identify the various economic factors influencing rice cultivation in the study area.

Methodology

This research article made use of both primary and secondary data. The secondary data regarding rainfall and temperature, area under rice and production and productivity of rice were

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collected for the last 18 years from various published and unpublished sources. The main sources are G – Returns, Season and Crop Reports, Statistics at a Glance, Economic Survey and records available in Meteorological Department, Chennai, District Statistical Office, Nagercoil and various libraries. Details regarding cost of production, gross income and net income are collected from the offices of Joint Director of Agriculture and Deputy Director of Horticulture. Primary data were collected directly from field experts. The oldest farmers' society called Kumari Mavatta Vivasaygal Sangam (Kanyakumari District Farmers' Development Society) was selected for identifying farmers. Out of 1045 registered members of the society, 105 were selected at random. Information regarding the influence of rainfall, temperature, net return, availability of farm workers and finance, occurrence of pests and diseases, disturbance of wild animals, irrigation problems, and reasons for shifting crops and future plan of farmers was collected from field experts through a scientifically prepared interview schedule. The collected data were processed, analysed and interpreted with the help of mathematical tools such as percentage and rate and statistical tools such as correlation coefficient, coefficient of determination and multiple regression and testing tools were also used wherever necessary.

Rice Cultivation in Kanyakumari District – Trend and Tendency

The district was once called 'the Rice Granary' of erstwhile Travancore State and 'Nanjil Nadu'. 'Nanjil' means 'plough' and 'Nadu' means 'region'. Kanyakumari district is the region where the main occupation is associated with plough. In the district, for many years, more than 50 per cent of the total geographical area is under cultivation and this puts the district's primary occupation as farming and farm-based avocations. In the district, on the basis of area under cultivation, rice topped the list among crops up to 2002-'03 and in 2003-'04, it was pushed to the third place due to deficiency in rainfall in the previous year, 2002-'03. In 2003-'04, first place goes to coconut with an area of 23664 hectares, rubber occupies second place with 18296 hectares and rice third with 17320 hectares. In 2004-'05, as there was an increase in the area under rice, rice was placed in the second place. After 2007-'08, rice once again occupied the third place. It is sure that it cannot occupy the lost glory as the area under rubber has continuously been increasing from 1997-'98 (18063 hectares) and area under coconut from 1979-'80 (15461 hectares) and conversion of rice field into rubber estate and coconut grove takes time and conversion of the opposite is a huge waste. The Table given below shows the area under rice cultivation in Kanyakumari district in different decades.

Table 1 : Rice Cultivation in Different Decades in Kanyakumari District

(in hectares)

Crop	1957-'58	1960s	1970s	1980s	1990s	2000s
Rice	58686	58167	53265	42124	34847	21909

Source: Calculated from Various Season and Crop Reports.

The above Table shows that the area under rice cultivation is declining decade after decade. The average area under cultivation of rice decreased from 58167 hectares in the sixties to 21909 hectares in the 2000s. The year-wise data show that the area under rice decreased from 58686 hectares in 1957-'58 to 18187

hectares in 2008-'09 and rice production decreased from 95300 tonnes in 1957-'58 to 83657 tonnes in 2008-'09. The productivity also shows a fall in nine years i.e., half of the period taken for analysis. The yearly data of area, production and productivity of rice from 1991-92 to 2008-'09 are given in Table 2.

**Table 2 : Area Production and Productivity of Rice in Kanyakumari District
From 1991-'92 to 2008-'09**

Year	Area (in hectare)	% Change*	Production (in tonnes)	% Change*	Productivity (in kg)	% Change*
1991-92	40572	-1.59	143220	12.05	3530	13.86
1992-93	38794	-4.38	118920	-16.97	3065	-13.16
1993-94	38541	-0.65	139260	17.10	3613	17.87
1994-95	37565	-2.53	151650	8.90	4037	11.73
1995-96	36020	-4.11	148730	-1.93	4129	2.28
1996-97	33659	-6.55	138930	-6.59	4128	-0.04
1997-98	31244	-7.17	118640	-14.60	3797	-8.00
1998-99	32004	2.43	152800	28.79	4774	25.73
1999-00	31475	-1.65	149480	-2.17	4749	-0.53
2000-01	28594	-9.15	135000	-9.69	4721	-0.59
2001-02	28229	-1.28	121390	-10.08	4300	-8.92
2002-03	26052	-7.71	98469	-18.88	3780	-12.10
2003-04	17320	-33.52	52897	-46.28	3054	-19.20
2004-05	22016	27.11	86486	63.50	3928	28.62
2005-06	21709	-1.39	82523	-4.58	3801	-3.23
2006-07	21406	-1.40	94130	14.07	4397	15.68
2007-08	20349	-4.94	90210	-4.16	4433	0.81
2008-09	18187	-10.62	83657	-7.26	4599.82	3.76

Source: Season and Crop Reports *Calculated figures.

The figures given below show both the linear (A & A) and the exponential (B & B) trend lines drawn both for area and production of rice. It is easy to understand from the graph that the rate of change of area per year is - 1377.7

hectares ($R^2 = 0.94$), and the rate of change of production per year is - 4295.5 tonnes ($R^2 = 0.58$). The rate of change of productivity per year is very small (0.37 quintals per year) and the R^2 value is also very small (0.14) and so details are not presented in diagram.

Figure 1
Area Under Rice in Kanyakumari District

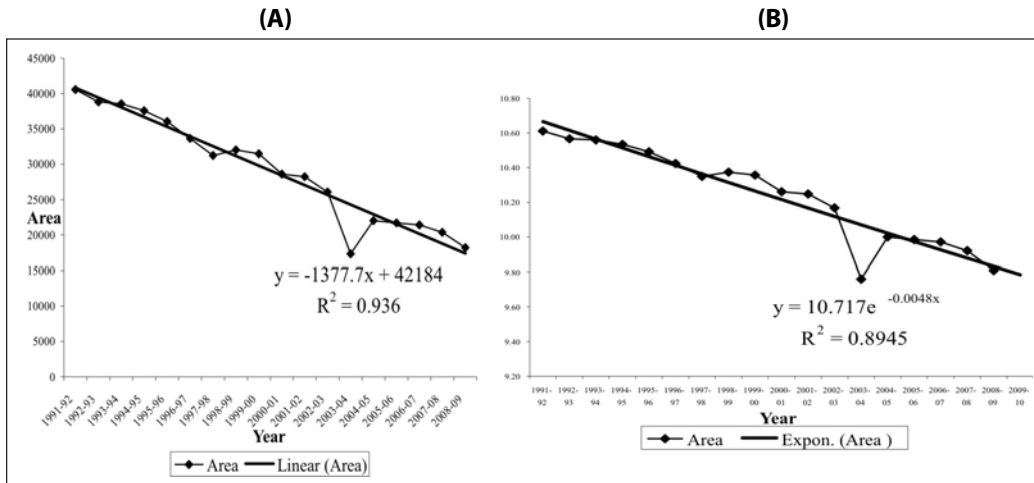
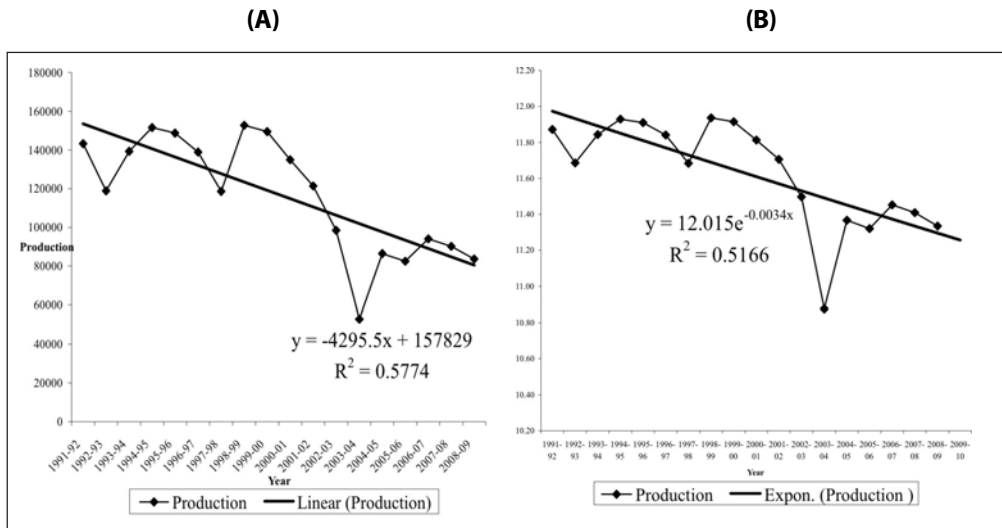


Figure 2
Production of Rice in Kanyakumari District



Calculation of growth rates is helpful for scientific analysis and so the growth rates are calculated and presented in Table 3.

Table 3 : Growth Rates of Area, Production and Productivity of Rice

Growth Rates	Area (%)	Production (%)	Productivity (%)
Exponential	-0.48	-0.34	-0.15
Average Annual	-3.07	-2.31	1.68
Per Year Fall/ Rise	-3.06	-3.25	1.68

Source: Calculated from Table 2.

It is obvious from Table 3 and figures that the area under rice cultivation declined at a rate of 0.48 per cent between 1991-'92 and 2008-'09. The same pattern can be observed in exponential growth rates for production and productivity. While the average annual growth rates show a fall of 3.07 and 2.31 respectively, for area and production, productivity shows a rise of 1.68. Reduction for one year in the area under rice is 3.06 per cent and it is 3.25 for the decline in the production of rice between 1991-'92 and 2008-'09. Productivity increases at a rate of 1.68 per cent for the same period.

It is better to find the falling pattern of area under rice at different periods of time. The overall per year reduction of area under rice is 1.35 per cent between 1957-'58 and 2008-'09, while the per year reduction is 0.91 per cent between 1957-'58 and 1991-'92, 3.16 per cent between 1995-'96 and 1999-'00 and 4.45 per cent between 2001-'02 and 2008-'09. It means that the decrease in area under rice between 2001-'02 and 2008-'09 is about 5 times more than the rate of decrease between 1957-'58 and 1991-'92. In absolute terms, per year reduction of area under rice is 532.76 hectares between

1957-'58 and 1991-'92, 794.09 hectares between 1957-'58 and 2008-'09, 1316.76 hectares between 1991-'92 and 2008-'09 and 1328.80 hectares between 1999-'00 and 2008-'09, for the last 10 years. It means that there will be no rice cultivation in the district after 2025. It is further confirmed by the block-wise data of area under cultivation, which are presented in Table 4. The cultivation of rice in Thiruvattar block is completely stopped and is almost stopped in Melpuram, Munchirai, Killiyoor and Thuckalay blocks. On the other hand, rice production in the district increased up to 1998-'99 i.e., from 95300 tonnes in 1957-'58 to 152800 tonnes in 1998-'99, a per year rise of 1.44 per cent. After 1998-'99, rice production decreased and reached 83657 tonnes in 2008-'09, a per year fall of 4.25 per cent. The productivity also moves in the same manner, a per year rise of 3.94 per cent between 1957-'58 and 1998-'99 and a per year fall of 0.33 per cent between 1998-'99 and 2008-'09. Between 1998-'99 and 2007-'08, production decreases at a rate of 4.25 per cent while productivity decreases at a rate of 0.33 per cent. It means that rice production decreases much due to the fall in the area under rice.

Table 4 : Block-wise Cultivation of Rice in Kanyakumari District

(Area in hectares)

Year	Thovalai	Agasteeswaram	Rajakkamangalam	Kurunthencode	Thuckalay	Thiruvattar	Melpuram	Killiyoor	Munchirai
1997-98	7787	7180	4634	4313	3914	495	853	1257	811
1998-99	7980	6988	4868	4816	3843	556	857	1276	826
1999-00	8277	7565	4506	4460	3438	207	878	1315	822
2000-01	8322	6652	4178	4390	2270	124	651	1170	837
2001-02	8145	6246	4190	4467	2280	130	690	1218	864
2002-03	8291	5662	3546	3870	1971	113	647	1138	814
2003-04	5539	3797	2363	2393	1298	56	443	863	568
2004-05	7319	4916	2993	2810	1796	114	473	968	627
2005-06	7317	5149	2897	2805	1302	87	461	1022	669
2006-07	7280	5081	2906	2736	1303	78	402	977	521
2007-08	7281	4889	2867	2606	1079	20	305	831	471
2008-09	6551	4681	2608	2327	896	0	210	538	377
2009-10	6718	4443	2608	2202	686	0	103	306	241

Source: Various issues of 'G' Return.

Table 5 shows how the use of land for agricultural purposes increases in the district. agricultural purposes decreases and non-

Table 5 : Area Under Agricultural and Non-Agricultural Uses

(in hectares)

Year	Food -crops	Non – food crops	Total cultivated area	Area under non-agricultural use
1991-92	67386 (40.30)	42433 (25.38)	109819 (65.68)	15923* (9.52)
1992-93	66721 (39.91)	42442 (25.38)	109163 (65.29)	16579* (9.92)
1993-94	65576 (39.22)	43149 (25.81)	108725 (65.03)	17017* (10.18)
1994-95	64568 (38.62)	43795 (26.19)	108363 (64.81)	17379* (10.39)
1995-96	61411 (36.73)	45148 (27.00)	106559 (63.73)	19183* (11.47)
1996-97	58520 (35.00)	42801 (25.60)	101321 (60.60)	24421* (14.61)
1997-98	57696 (34.51)	41422 (24.77)	99118 (59.28)	25073 (15.00)
1998-99	59065 (35.33)	41588 (24.87)	100653 (60.20)	25089 (15.01)
1999-00	58747 (35.14)	42300 (25.30)	101047 (60.44)	25095 (15.01)
2000-01	55362 (33.11)	43086 (25.77)	98448 (58.88)	25163 (15.05)
2001-02	55137 (32.98)	43187 (25.83)	98324 (58.81)	25313 (15.14)
2002-03	51389 (30.74)	42985 (25.71)	94374 (56.44)	25435 (15.21)
2003-04	43528 (26.03)	44276 (26.48)	87804 (52.51)	26287 (15.72)
2004-05	46795 (27.99)	44712 (26.74)	91507 (54.73)	26337 (15.75)
2005-06	45982 (27.50)	45825 (27.41)	91807 (54.91)	26890 (16.08)
2006-07	46113 (27.58)	46439 (27.77)	92552 (55.35)	28178 (16.85)
2007-08	43593 (26.07)	47407 (28.35)	91000 (54.43)	28255 (16.90)
2008-09	41105 (24.58)	47687 (28.52)	88792 (53.11)	28331 (16.94)

Source: Various issues of 'G return' and Season and Crop Reports.

* Estimated figures. Figures in parentheses are their respective percentages.

From the above Table, it is very easy to understand that the share of area under food crops shows a sharp fall while the share of area under non-agricultural purposes shows a sharp rise. The decrease in area under food crops is 39 per cent against a rise of 78 per cent for the area under non-agricultural purposes. It means that within a short period of time all the area under

food crops may be used for non-agricultural purposes or for cultivating some other crops. In the district the number of cultivators also decreased considerably. In 1961, there were 72865 cultivators and in 1991, there were only 61547 cultivators. The number further decreased to 13434 in 2001 (Census Reports).

Table 6 shows the share of rice to total geographical area, to total cultivated area and to area under food-crops from 1991-'92 to 2008-'09 in the district.

Table 6 : Share of Area Under Rice to the Total Geographical and Cultivated Area in the District

(in percentage)

Year	Share to total geographical area	Share to total cultivated area	Share to area under food-crops
1991-92	24.27	36.94	60.20
1992-93	23.20	35.54	58.14
1993-94	23.05	35.45	58.77
1994-95	22.47	34.67	58.17
1995-96	21.54	33.80	58.65
1996-97	20.13	33.22	57.51
1997-98	18.69	31.52	54.15
1998-99	19.14	31.80	54.18
1999-00	18.82	31.15	53.57
2000-01	17.10	29.04	51.64
2001-02	16.88	28.71	51.19
2002-03	15.58	27.61	50.69
2003-04	10.36	19.73	39.79
2004-05	13.17	24.06	47.04
2005-06	12.98	23.65	47.21
2006-07	12.80	23.13	46.42
2007-08	12.17	22.36	46.67
2008-09	10.88	20.48	44.24

Source: Calculated figures.

The share of area under rice cultivation to total geographical area decreased from 24.27 per cent in 1991-'92 to 10.88 per cent in 2008-'09, i.e., nearly 14 per cent fall within a period of 18 years. In the same way, the share of area under rice to total cultivated area decreased from 36.94 to 20.48 per cent in the same period, i.e., nearly

17 per cent decline within 18 years. The share of area under rice to area under food-crops also shows a decline, 60.20 per cent in 1991-'92 to 44.24 per cent in 2008-'09, nearly 16 per cent decline. All these details are available in Table 6.

The per capita production of rice is the best indicator of real situation of rice production

as population is increasing while rice production goes on decreasing. In Kanyakumari district, population increased from 1591174 in 1991 to 1825746 in 2011. Production of rice decreased

from 143220 tonnes in 1991-'92 to 83657 tonnes in 2008-'09. So a comparison of per capita rice production in the district is made with the national per capita availability and consumption of rice and is presented in Table 7.

Table 7 : Per capita Rice Production in Comparison with the National Per Capita Availability of Rice During 1991, 2001 & 2008

Year	Per capita net availability of food-grains in India (kg)	Per capita net availability of rice in India (kg)	Population in KK district	Rice production in KK district (Tonnes)	Per capita rice production in KK district ✪ (kg)	% Share to national food-grains ✪	% Share to national rice✪
1991	171.1	79.2 (46.29)	1591174	143220	90.01	52.61	113.65
2001	180.4	83.5 (46.29)	1676034	13500	80.55	44.65	96.47
2008	162.1	68.8 (42.44)	1795774♦	83657	46.59	28.74	67.72

Source: Statistics at a Glance 2010-11.

♦ Calculated from Census Figures ✪ Calculated Figures.

It is very clear from Table 7 that Kanyakumari district, which produced nearly 14 per cent excess rice in 1991, produced 32.28 per cent less than the national average in 2008. Its share to national availability of foodgrains also decreased from 52.61 per cent in 1991 to 28.74 per cent in 2008 just like the per capita production of rice, which decreased from 90.01kg to 46.59 kg in the same period. It is already observed that in 2000, 74 per cent of arrivals of rice to the Kottar market, the main purchasing centre for the whole district, is out-station purchases made by the local merchants and in the near future every grain must be purchased from other districts and States.

Influencing Factors of Rice Cultivation

To avoid the situation of no-rice cultivation in the near future in Kanyakumari district, one must know the reasons. Otherwise the problem cannot be solved. Here, an attempt is made to find out the real reasons for the decrease in the area under cultivation and production of rice in the study area.

Ecological Factors

There are many ecological factors. But rainfall and temperature are the two recognised ecological factors causing disturbances in crop cultivation. Table 8 shows the rainfall pattern and the average of the highest maximum temperature prevailing in the district from 1991-'92 to 2008-'09.

Table 8 : Rainfall and Temperature in Kanyakumari District from 1991-'92 to 2008-'09

Year	Rainfall (in mm)	Temperature (in °C)
1991-92	1882.0	32.94
1992-93	1744.3	32.85
1993-94	1877.4	32.93
1994-95	1776.7	33.33
1995-96	1343.8	32.96
1996-97	1519.3	33.43
1997-98	1656.0	33.50
1998-99	2248.4	33.58
1999-00	1535.3	33.22
2000-01	1750.5	33.62
2001-02	1526.5	33.93
2002-03	1207.0	33.47
2003-04	1208.2	34.10
2004-05	1436.9	33.34
2005-06	1694.8	33.31
2006-07	1553.5	33.11
2007-08	1795.3	33.58
2008-09	1551.3	33.40

Source: Records, Assistant Director, District Statistical Office, Nagercoil & Meteorological Department of Tamil Nadu, Chennai.

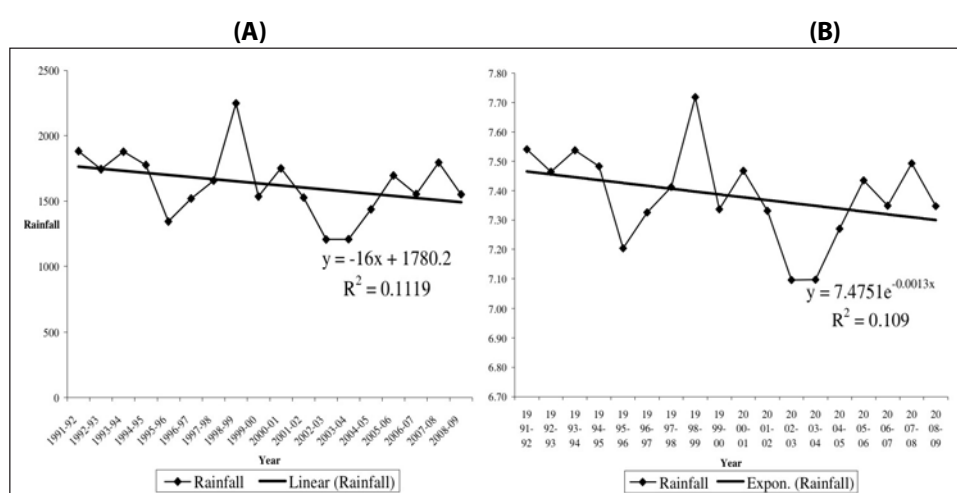
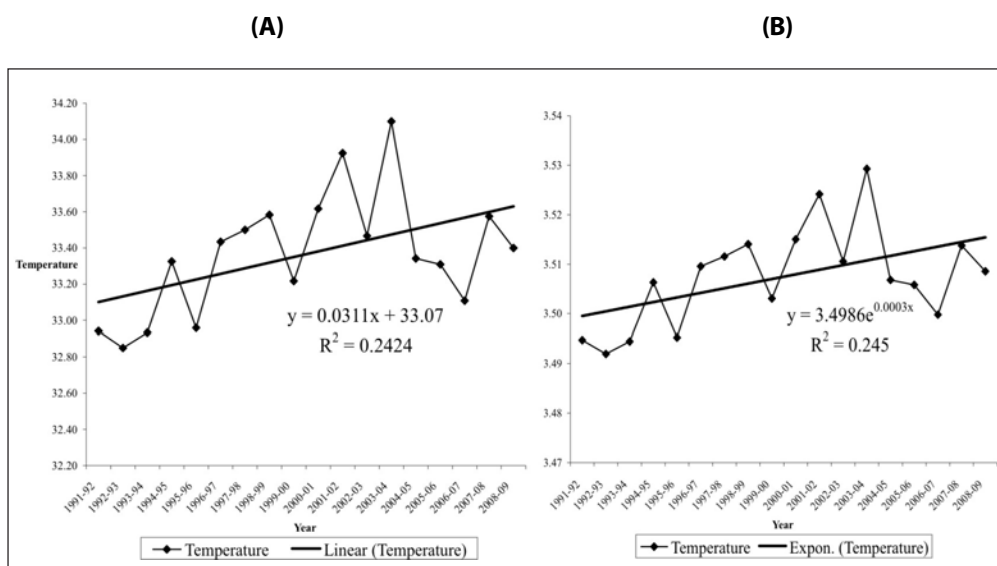
Figure 3 : Rainfall in Kanyakumari District

Figure 4 : Temperature in Kanyakumari District

It is easily understandable from Table 8 and Figures 3 and 4 that rainfall has a falling trend while temperature shows a small but steady increase. Hence, the standard deviation for rainfall is 255.34 mm and for temperature it is only 0.34°C. The rate of change for rainfall per year is -16 mm ($R^2=0.11$) and the rate of change of temperature is 0.03°C ($R^2 = 0.24$). The exponential growth rate calculated for rainfall is -0.13 ($R^2=0.11$) per cent while for temperature it is 0.03 ($R^2=0.25$).

Economic Factors

Quantifiable information available regarding economic factors is only the minimum

support price offered by the Central government. The minimum support prices (MSP) are available from 2000-'01 to 2010-'11. And so comparison is made only for nine years as data for other factors are available only up to 2008-'09. The cost of production and net income are available only for 1987-'88 and 2004-'05, with which one can compare the net return as there is enough distance between two years. The MSPs offered by the Central government are illustrated in Table 9.

Table 9 : Minimum Support Prices Offered from 2000-'01 to 2010-'11 (in ₹)

Year	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
MSPC	510	530	530	550	560	570	580	850	850	950	1000
MSPA	-	-	-	-	590	600	610	880	880	980	1030

Source: Economic Survey 2010-11, MSPC = MSP for common varieties, MSPA = MSP for 'A' Grade.

From the above Table it is easy to understand that support prices increase very slowly.

To understand the impact of one factor on another, anyone, who has a limited knowledge in Statistics and Econometrics, can depend on correlation and regression coefficients. Hence, correlation coefficients between area under rice cultivation and rainfall,

temperature and MSP ($A = f(R, T, MSP)$), between production of rice and rainfall, temperature, productivity and MSP ($P = f(R, T, Pt, MSP)$) and between productivity and rainfall, temperature and MSP ($Pt = f(R, T, MSP)$) and multiple regression coefficients have been calculated. Table 10 explains the correlation existing between area, production and productivity of rice and climate factors and MSP.

Table 10 : Correlation Between Rainfall, Temperature and Area, Production and Productivity of Rice

Factors	Area	Production	Productivity
Rainfall	0.42 ^{NS}	0.50*	0.25 ^{NS}
Temperature	-0.58*	-0.41 ^{NS}	0.16 ^{NS}
MSP	-0.57*	-0.26	0.39 ^{NS}

Source: Calculated figures, * Significant at 5% level NS = Not Significant.

From the above Table, it is very clear that there is significant positive correlation between rice production and rainfall and significant negative correlation between area under rice and temperature. The correlation between area under rice and rainfall is 0.42 and between production and temperature is -0.41, both are not significant. The correlation between productivity and rainfall as well as temperature shows only very poor relation. The correlation between area under rice and MSP is significant, -0.57 and between production and MSP is insignificant, -0.26. The correlation between productivity and MSP is also not significant. The two main inferences drawn from the above data analysis are; area under rice cultivation decreased significantly due to rise in temperature, and rice production decreased significantly due to fall in rainfall. Simply saying, the two climate factors

played a dominant role in affecting rice cultivation adversely. However, MSPs have only negative impact on both the area under rice and production of rice.

As the rainfall and the MSP in a particular season/year have their impact on the dependent factors for the coming season or year, Lag and Lead correlation is calculated to know this effect. The Lag and Lead correlation also shows the same trend except a small variation in the size of the number. The correlation values between rainfall and area under rice cultivation, rainfall and production and production and MSP show a rise from 0.42 to 0.48, from 0.50 to 0.58 and -0.26 to 0.54, respectively. The productivity value for rainfall and MSP also shows a rise. However, other values show a small fall. Details are given in Table 11.

Table 11 : Lag and Lead Correlation Between Rainfall, Temperature and Area, Production and Productivity of Rice

Factors	Area	Production	Productivity
Rainfall	0.48*	0.58*	0.35 ^{NS}
Highest Maximum Temperature	-0.53*	-0.38 ^{NS}	0.16 ^{NS}
MSP	-0.18 ^{NS}	0.54 ^{NS}	0.87*

Source: Calculated * Significant at 5% level, NS = Not Significant.

The regression equations given below show the contribution of each factor to the variation in dependent factors, area under rice, production and productivity of rice.

$$A = -20672.17 - 0.47^{NS}X_1 - 0.098^{NS}X_2 - 0.73^{**}X_3, R^2 = 0.49^{NS}$$

$$P = -300507.06^{**} + 0.038^{NS}X_1 + 0.086^{*}X_2 + 0.62^{**}X_3 + 0.54^{**}X_4 - 0.12^{*}X_5, R^2 = 0.99^{**}$$

$$P_t = -11855.18^{NS} + 0.63^{NS}X_1 - 0.18^{NS}X_2 + 0.12^{NS}X_3, R^2 = 0.57^{NS}$$

** = Significant at 1% level, * = Significant at 5% level, NS = Not significant

A = Area, P = Production, Pt = Productivity

X_1 = Rainfall, X_2 = Temperature, X_3 = Area, X_4 = Productivity, X_5 = MSPC.

From these regression equations it is clear that the area under rice is influenced neither by rainfall nor by temperature but by MSPC, while the production is affected by temperature, area, productivity and MSPC. However rainfall, temperature and MSPC have no influence on productivity. Simply saying, the important climate factor, rainfall, has no impact not only on the area under rice, but also on the production and productivity of rice. The primary data collected from field experts show a different picture (Refer Table 13) and they opined that less rainfall is one of the main reasons for the fall in the area under rice cultivation. For example, the area under rice declined sharply in 2003-'04, from 26052 in 2002-'03 to 17320 hectares in 2003-'04 due to less rainfall in 2002-'03, from

1526.5 mm in 2001-'02 to 1207.02 mm in 2002-'03 (Refer Tables 2 and 8). It confirms the view of farmers.

Another factor influencing rice cultivation is the cost of production, which rises at a very high speed. For example, the cost of production of rice per tonne (common variety) increased from ₹ 1450 in 1987-'88 to ₹ 13540 in 2004-'05. The increase in cost of production is 833.79 per cent between 1987-'88 and 2004-'05, a per year increase of 49.05 per cent. However, the increase in the support price is only 96.07 per cent, a per year rise of only 8.73 per cent between 2001-'02 and 2010-'11. It is reported by Swaminathan (2011) that the cost of production of rice is ₹ 1270 and the minimum support price is only ₹ 1080. The cost of production of rice calculated by farmers' societies (ranges between ₹ 15500 and 18300) is also much higher than the cost calculated by the agricultural department. The share of net income to total cost of production for all crops except common rice and banana of ordinary variety increased from 1987-'88 to 2004-'05, for tapioca from 63 to 186 per cent, for coconut from 90 to 106 per cent, for banana (Nendran) from 57 to 116 and rice (HYV) from 50 to 52 and for rubber from 220 to 256 per cent. The net return decreased for rice (common) from 46 to 42 per cent and for banana (ordinary) from 105 to 80 per cent in the same period. The net return over the cost of production for rubber increased from 220 in 1987-'88 to 256 per cent in 2004-'05 while for rice it decreased from 46 to 42 for common variety (as per the calculation

of farmers' societies it ranges from 10 to 29 per cent), though the net return for high-yielding variety increased from 50 to 52.

Details regarding cost of production, gross income, net income and percentage of net income to the cost of production are portrayed in Table 12.

Table 12 : Cost of Production, Gross Income and Net Income of Important Crops in Kanyakumari District in 1987-'88 and 2004-'05

(in ₹ per hectare)

Crops		1987-'88				2004-'05			
		Cost	GI	NI	% to cost	Cost	GI	NI	% to cost
Rice	HYV	1838	2757	919	50	13265	20130	6865	52
	Common	1450	2120	670	46	13540	19240	5690	42
Banana	Common	3120	6400	3280	105	25000	45000	20000	80
	Nendran	6120	9600	3480	57	37000	80000	43000	116
Tapioca	1640	2660	1020	63	7000	20000	13000	186	
Coconut	2625	5075	2450	90	14125	29140	15015	106	
Rubber	2250	7200	4950	220	22500	80000	57500	256	

Source : Joint Director of Agriculture, & Deputy Director of Horticulture, Nagercoil.

Note: GI = gross income NI = net income.

The net return from rubber is the highest in comparison with other crops. It is the nature of all human beings to go after the highest net revenue yielding project. Hence, there is no wonder in moving of farmers towards rubber cultivation. Farmers cultivate rubber whenever and wherever possible. In five blocks of Thiruvattar, Melpuram, Munchirai, Killiyoor and Thuckalay, which are suitable to cultivate rubber also, farmers shifted to rubber from rice. In other blocks they shifted to coconut or banana or used rice fields for non-agricultural purposes. Further, rice is highly labour intensive and it is reported that in 2001 nearly 70 per cent of production cost of rice was labour cost. Though the net income of coconut is not much, farmers prefer coconut as it is a less labour-intensive crop. It means that economic factors also have a

significant role in reducing area under rice cultivation and rice production.

There are other reasons also for farmers to quit rice cultivation. To know the other reasons, primary data were collected directly from field experts. The oldest farmers' society called Kumari Mavatta Vivasaygal Sangam (Kanyakumari District Farmers' Development Society) was selected for identifying farmers. Out of 1045 registered members of the society, 105 were selected at random for collecting information regarding the influence of rainfall, temperature, net return, availability of farm workers and finance, irrigation problems, and reasons for shifting crops. The various reasons for changing crops by farmers are available in Table 13.

Table 13 : Reasons for Changing the Crop

Reasons for Shift	No. of Respondents
Rainfall	12
Non-remunerative price	20
Rainfall and low price	47
Low profit and labour shortage	28
Disturbance of wild animals	6
Irrigation problem	12
Less involvement of other members of family	7
Diseases	2

Source: Primary Data.

The main economic factor that affects rice cultivation adversely is the non-remunerative price existing in the market in comparison with the cost of production. It is indicated by the farmers' opinion that 20 farmers have expressed the low price as the sole reason whereas 47 farmers attributed to rainfall and low price as the reasons and 28 farmers pointed out that low profit and labour shortage as the reasons for shift

in cultivation. The other factors that have some influence in bringing down the area under rice are irrigation problem and labour shortage. Hesitation of other members of the family to engage in cultivation is also one of the reasons for the reduction in the area under rice cultivation. Table 14 shows how many family members are involved in rice cultivation in the surveyed households.

Table 14 : Age Group and Number of People Engaged in Agriculture

Age Group	No. of People Engaged in Agriculture					
	1		2		3	
	No. of respondents	Percentage	No. of respondents	Percentage	No. of respondents	Percentage
21 – 40	10	15.62	3	9.37	0	0
41 – 60	28	43.75	16	50	7	77.78
61 – 80	26	40.63	13	40.63	2	22.22
Total	64	100	32	100	9	100

Source: Primary Data.

Note: 1 - Only the respondent was engaged in agriculture.

2 - The respondent and one family member had participation in agriculture.

3 - Three members were engaged in agriculture.

From the above Table, it is observed that only in nine households two other family members, in 32 households one more family member and in 64 households only the respondent, were involved in rice farming. In the age group of 21 – 40 years, there are only 10

respondents in the first group and three respondents in the second group. In total, only 13 members (12.38 per cent) below the age of 40 are involved in cultivation. It means that future generation is not ready to involve in farming. Details of the present crop and the previous crop are depicted in Table 15.

Table 15 : Present and Previous Crops of the Respondents

Present crop	Previous crop	No. of Respondents
Rice	Rice	35
Banana	Rice	7
Tapioca	Rice	8
Rubber	Rice	15
Coconut	Rice	11
Coconut and rubber	Rice	6
Banana and tapioca	Rice	4
Banana and coconut	Rice	8
Rice and coconut	Rice	6
Total		100*

Source: Primary Data.

* Five farmers are excluded as they frequently change their crops from rice to banana or tapioca and vice versa.

It is very clear from the above Table that 65 farmers changed their crops out of 105 surveyed and all from rice crop to some other

crops. The period, when they shifted to other crops from rice is presented in Table 16.

Table 16 : When the Respondents Changed Their Crops

Before (in years)	No. of Respondents	Percentage
30	4	6.15
25	3	4.62
20	5	7.70
15	9	13.85
10	8	12.30
6	7	10.77
5	11	16.92
2	13	20.00
1	5	7.69
Total	65	100

Source: Primary Data.

The above Table shows that out of 65 farmers who changed their crops, 44 (67.69 per cent) farmers shifted their crops within 10 years.

The reasons for having the present crop are presented in Table 17.

Table 17 : Reasons for Having the Present Crop

Reasons	Rice	Banana	Tapioca	Coconut	Rubber	Total
More profit	-	-	-	-	5	5
Less labour-intensive	-	-	5	2	-	7
More profit and less labour-intensive	-	15	4	21	18	58
Others	35	-	-	0	0	35
Total	35	15	9	23	23	105

Source: Primary Data.

As it is clear from the above Table, 35 farmers cultivate rice because they do it traditionally and to meet the rice requirement of their families and fodder needs of their cattle. Fifty five per cent of farmers (58) cultivate those crops that give more profit but at the same time less labour-intensive.

To know whether the farmers will continue in the cultivation of the same crop or change their crop in future, opinion is sought from them and information provided by them is presented in Table 18.

Table 18 : Future Plan of the Respondents

Future Plan	No. of Respondents	Percentage
Rice	14	13.33
Banana	9	8.57
Tapioca	4	3.80
Coconut	16	15.23
Rubber	21	20.00
Coconut and Rubber	2	1.90
Banana and Tapioca	5	4.76
Banana and Coconut	5	4.76
Non-agricultural	29	27.61
Total	105	100

Source: Primary Data.

It is very sad to observe that only 14 farmers (13.33 per cent) are ready to continue with rice cultivation in the future and 29 farmers

(27.61 per cent) have the intention of using their land for non-agricultural purposes. The remaining 62 farmers (59.04 per cent) are ready to continue

with cultivation but crops other than rice. It is further observed that 21 farmers out of 35 (60 per cent), who are cultivating rice, are ready to quit rice cultivation. It means that the district is moving away from self-sufficiency.

From the above analysis, it is easy to conclude that ecological factors make the income uncertain, while economic factors make rice cultivation non-profitable and so farmers are quitting rice farming. Area under rice cultivation is not much adversely affected by rainfall but by temperature. Rainfall affected rice production significantly. Temperature significantly influenced area under rice but only insignificantly affected production of rice. Area under rice strongly influenced production, while productivity was affected neither by rainfall nor by temperature. The economic factors affecting rice cultivation are low price in comparison with cost of production, non-availability of inputs particularly labour, irrigation problems particularly in tail-end farms and disturbances of wild animals mainly in farms adjacent to forest area. The minimum support prices offered by governments are also not attractive. All these factors finally have an adverse impact on the area under cultivation and thereby rice production. Hence, suitable steps should be taken on a war footing way to increase the area under rice cultivation and rice production.

Policy Implications

The following ideas may help authorities overcome the adverse impact of ecological and economic factors on rice farming.

Farmers can produce more, and more area can be brought under cultivation if proper steps are being taken by the government. As told by Swaminathan (2010), through integrated measures, soil health can be enhanced by improving organic matter and macro and micro-nutrient content as well as the physics and the micro-biology of the soil. The programme of soil health cards can be introduced in all States as it is in Gujarat.

In water scarce area, promotion of water harvesting, conservation and efficient and equitable use of water by empowering gram 'sabhas' to function as 'Pani Panchayats' will benefit the farming community, which in turn ensures high per capita availability of rice in the district.

Immediately credit reforms and insurance literacy must be initiated. Universal coverage of farmers by crop insurance favours farmers who are at the risk of crop failures due to fluctuations of rainfall, drought and flood, and temperature. Steps should also be taken to mitigate the challenges of ecological factors particularly the falling rainfall and rising temperature.

The decrease in production of rice can be overcome by increasing the productivity. To increase the productivity, the growing gap between scientific know-how and field level do-how should be bridged.

One of the main reasons for quitting rice farming is the non-remunerative price that the rice farmers get. The reason for non-remunerative price is middlemen who exploit both producers and consumers. It was reported that farmers got only 10 to 15 rupees while consumers paid 80 to 100 rupees per kg of onion in 2009-'10. As farmers shift from less remunerative to more remunerative crops, it is the duty of the government to make rice also remunerative either by fixing a high support price or by giving subsidy as it is in the USA and in some other countries. In the USA, Japan and France, subsidies given are more than what the farmers produced. In India, agricultural subsidies stood at about 3 to 6 per cent of the total output, whereas it was 72 per cent in Japan, 37 per cent in EU and 27 per cent in the USA (Sharma 2004).

The minimum support price offered by the government did not cover even the cost. And so the minimum support price must be increased to cover the cost of production as well as a sumptuous margin.

Another reason for the decline in the area under rice cultivation is labour shortage and in turn it leads to high wage rate. Hence steps should be taken to remove labour shortage. It can be attained by mechanising all the processes of rice cultivation and also by making the youth involve in agriculture.

The conversion of land meant for food crops into housing plots and shopping complexes and other non-agricultural purposes should be curbed. Steps should also be taken to control the disturbance of wild animals.

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ROLE PERFORMANCE OF RURAL WOMEN IN VERMICULTURE ENTERPRISE

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ABSTRACT

The present study was undertaken in a village of Murtizapur Panchayat Samiti of Akola district in Maharashtra State. Majority of respondents were having high level role performance in vermiculture enterprise. Regarding the relational analysis, independent variables namely education, landholding, annual income, socio-economic status, experience in vermiculture enterprise, economic motivation and scientific orientation were found to be significant with role performance whereas age did not show significant correlation. The multiple regression of all nine variables showed 87.83 per cent variation in role performance.

Introduction

Vermiculture enterprise is a relatively new enterprise that is spreading rapidly among women in rural areas. As the vermiculture enterprise is less expensive in terms of costs and relatively more intensive in terms of labour, it provides them relatively fair employment with less investment. Vermicompost is the production of blackish, light weighed and granular material after the metabolic produce of earthworm which is a rich source of plant nutrients like N, P, K, Ca, Mg, Co, etc. Vermicomposting is an excellent technique for recycling food waste. It is a complete plant nutrient and contains not only worm casting but also bedding material and organic waste at various stages of decomposting (Urmila Gupta *et al.* 2006).

The resulting fine-grained compost can be applied before sowing, or as top-dressing after germination. Vermicompost is used primarily for high-value crops, such as spices, sugarcane,

vegetables, and fruit orchards (Butterworth, *et.al.* 2002). In international market those products which are cultivated by the use of organic resources only have more value. So the use of natural organic manures increases our hope to compete in international markets and earn more foreign reserves and currency. Rural women can play a vital role in vermiculture management too as they make major efforts for development and production of vermiculture. They are getting more employment through vermiculture enterprise. This context draws attention to study the role performance of rural women in vermiculture enterprise and constraints faced by them while playing an important role.

Besides household activities, there has been increased participation of women in agriculture and allied activities. They also play a key role in vermiculture enterprise and had become income generator for their livelihood. Therefore, it is also necessary to study and find

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out key areas of their role performance in vermiculture enterprise; so as to impart them appropriate training and capacity building. Besides, it is also needed to study relationship between the socio-personal, socio-economic, communication, psychological characteristics of the rural women engaged in vermiculture enterprise and their role performance.

In this context, an attempt was made to study the contribution made by rural women in the form of role performance in vermiculture enterprise. Besides, effort has been made to study role performance in relation with their socio-economic status and psychological characteristics.

Methodology

The present study was carried out in a purposively selected village Chickhli (Kasvi) in Murtizapur Panchayat Samiti of Akola district of Vidarbha region in Maharashtra. It is because more number of women population in this panchayat samiti happen to be engaged in vermiculture enterprise. For the present study exploratory design of social research was used. The study was conducted on rural women. Rural women refer, in the study to those women who are employed in farming and carrying out various vermiculture practices in rural area. The sample for study comprised 25 rural women. For the measurement of the variables, different scales were used like socio-economic status of the respondents was measured with the help of scale developed by Thakare (2004), for economic motivation and scientific orientation value of the farmers a scale developed by Supe (1969) was used. On the basis of the maximum and minimum score obtained, the respondents were categorised as follows.

Role performance was operationally defined as the physical performance of various vermiculture practices by the respondents in vermiculture enterprise. The role performance of each operation was measured on three point continuum viz., always, sometimes and never. The score assigned to these categories were 2, 1 and 0, respectively. The role performance score on all the items for individual rural women was ascertained and the index was worked out with the help of following formula :

$$\text{Role performance index} = \frac{\text{Sum of obtained score}}{\text{Total obtainable score}} \times 100$$

On the basis of index range they were categorised as below :

S.No.	Category	Index range
1	Low	Up to 33.33
2	Medium	33.34 to 66.66
3	High	66.67 and above

Results and Discussion

Characteristics of the Respondents : The results of the selected personal, socio-economic, communication and psychological characteristics of respondents are presented in Table 1. The data in Table 1 revealed that majority of respondents included were young i.e. up to 35 years age group having education up to middle and high school, annual income ranging between ₹ 50,001 to ₹ 75,000 and above ₹ 1,00,001, semi-medium landholding, very high socio-economic status, 1.1 to 2 year of experience, medium source of information, high economic motivation and scientific orientation.

Table 1 : Distribution of Respondents According to Their Selected Characteristics

S. No.	Category	Respondents	
		Number	Percentage
Age			
1	Young (up to 35 years)	15	60.00
2	Middle (36 to 45 years)	7	28.00
3	Old (above 45 years)	3	12.00
	Total	25	100.00
Education			
1	Illiterate	1	4.00
2	Primary school	4	16.00
3	Middle school	8	32.00
4	High school	8	32.00
5	College	4	16.00
Landholding			
1	Marginal (up to 1.00 ha)	0	0.00
2	Small (1.01 to 2.00 ha)	5	20.00
3	Semi-medium (2.01 to 4.00 ha)	10	40.00
4	Medium (4.01 to 10.00 ha)	9	36.00
5	Large (above 10.00 ha)	1	4.00
Annual income			
1	Up to ₹ 50,000	2	8.00
2	₹ 50,001 to ₹ 75,000	9	36.00
3	₹ 75,001 to ₹ 1,00,000	5	20.00
4	₹1,00,001 and above	9	36.00
Socio-economic status			
1	Very low (Up to 6.42)	2	8.00
2	Low (6.43 to 7.47)	3	12.00
3	Moderate(7.48 to 8.52)	8	32.00
4	Moderately high (8.53 to 9.57)	3	12.00
5	Very high (9.58 to above)	9	36.00
Experience in years			
1	Up to 1 year	9	36.00
2	1.1 to 2 years	10	40.00
3	More than 2 years	6	24.00
Source of information			
1	Low	4	16.00
2	Medium	17	68.00
3	High	4	16.00
Economic motivation			
1	Low	3	12.00
2	Medium	10	40.00
3	High	12	48.00
Scientific orientation			
1	Low	2	8.00
2	Medium	4	16.00
3	High	19	76.00

Role Performance of Respondents in Vermiculture Enterprise : According to the study objective, attempts have been made to study the role performance in vermiculture enterprise by the respondents. The activities for role performance in vermiculture enterprise from selection of site to selling of vermicompost as well as its allied by-products were considered for the present study. The activity-wise role performance of rural women in vermiculture enterprise was studied on three-point continuum i.e. always, sometimes and never and the results are presented in Table 2.

The data presented in Table 2 revealed that, 'always performed' activities were : making arrangement in vermiculture enterprise so as to provide shade to earthworm (72 per cent), selection of composting material to prepare vermiculture (68 per cent), selection of site for a vermiculture enterprise (68 per cent), timely watering on bed/pits (64 per cent), collection and sorting of vermicompost and its by-products (64 per cent), , storing of vermicompost (60 per cent), covering the bed/pit with suitable material in order to protect the earthworms (56 per cent), selection of appropriate method of vermiculture (48 per cent), arrangement of composting material in sequence and properly for preparation of vermicompost (44 per cent).

The 'sometimes' role performance included activities namely, protection of earthworms from its natural enemies (64 per cent), selection of inoculant earthworm species for vermiculture enterprise (60 per cent), selling of vermicompost as well as its allied by-products (56 per cent), preparation of beds/ digging of pits for vermiculture enterprise (52 per cent), putting/ filling of vermicompost in gunny / plastic bags for marketing (52 per cent), mixing of composting material so as to prepare feed mixture for earthworm (48 per cent).

Further, it was found that arranging composting material in sequence and properly for preparation of vermicompost (20 per cent), mixing of composting material so as to prepare food mixture for earthworm (20 per cent) and selection of appropriate method of vermicompost (16 per cent) and covering the bed/pit with suitable material in order to protect the earthworms (8 per cent) were the activities never performed by respondent rural women.

From the above findings it may be said that rural women perform most of the vermiculture operations always. The findings of Jyosila (1985) supported the present study which reported that rural women take care of most of the farm operations like compost making operation, application of manures and fertilisers, sowing, transplanting, storage of fertilisers etc.

It could thus be inferred that rural women in vermiculture enterprise always perform most of the activities. However, some of the activities like arranging composting material in sequence and properly for preparation of vermicompost and mixing of composting material so as to prepare feed mixture for earthworm were never performed by 20 per cent of the rural women. It might be due to reason that these activities are labour oriented and hence these would have been got done by the labourers. Few activities were performed sometimes by relatively higher proportion of the respondent rural women. These activities were performed many times by the farmers or labour and the farm women were forced to perform them in absence of the farmers or the labour intended to perform the particular activity.

Extent of Role Performance by Respondents in Vermiculture Enterprise : The categorisation of rural women according to their extent of role performance is presented in Table 3.

Table 2 : Distribution of Respondents According to Their Activity-wise Role Performance in Vermiculture Enterprise

S. No.	Activities in vermiculture enterprise	Role performance (N=25)		
		Always	Some-times	Never
1	Selection of site for vermiculture enterprise	17 (68.00)	8 (32.00)	0 (0.00)
2	Making arrangement in vermiculture enterprise so as to provide shade to earthworm	18 (72.00)	7 (28.00)	0 (0.00)
3	Selection of inoculated earthworm culture species for vermiculture enterprise	10 (40.00)	15 (60.00)	0 (0.00)
4	Selection of appropriate method of vermiculture	12 (48.00)	9 (36.00)	4 16.00
5	Selection of compositing material to prepare vermiculture	17 (68.00)	8 (32.00)	0 (0.00)
6	Preparation of beds/ digging of pits for vermiculture enterprise	12 (48.00)	13 (52.00)	0 (0.00)
7	Arranging composting material in sequence and properly for preparation of vermicompost	11 (44.00)	9 (36.00)	5 (20.00)
8	Mixing of composting material so as to prepare feed mixture for earthworm	8 (32.00)	12 (48.00)	5 (20.00)
9	Covering the bed/pit with suitable material in order to protect the earthworms	14 (56.00)	9 (36.00)	2 (08.00)
10	Protection of earthworms from its natural enemies	9 (36.00)	16 (64.00)	0 (0.00)
11	Timely watering on bed/pits	16 (64.00)	9 (36.00)	0 (0.00)
12	Collection and sorting of vermicompost and its by-products	16 (64.00)	9 (36.00)	0 (0.00)
13	Storing of vermicompost	15 (60.00)	10 (40.00)	0 (0.00)
14	Putting/ filling of vermicompost in gunny/ plastic bags for marketing	12 (48.00)	13 (52.00)	0 (0.00)
15	Selling of vermicompost as well as its allied by-products	11(44.00)	14(56.00)	0(0.00)

Table 3 : Distribution of Respondents According to Their Role Performance

S. No.	Extent of role performance	Respondents (n=25)	
		Number	Per cent
1	Low	0	0.00
2	Medium	6	24.00
3	High	19	76.00
Total		25	100.00

The extent of role performance of rural women revealed that majority of them (76 per cent) have high level of role performance followed by 24 per cent of them who were found in medium level of role performance category. None of the respondents appeared in low category of role performance. Thus, it could be inferred that majority of the respondents were found in high level of role performance. The present finding is supported by Varsha Rathod (2006), Nita Divekar (2010) and Mankar *et al.* (2013).

Relational Analysis: Efforts have been made to find out the relationship of selected personal,

socio-economic, communication and psychological characteristics of rural women with their role performance in vermiculture enterprise. Attempts were also made to work out the contribution of selected variables in influencing the role performance of rural women.

Relationship of Selected Characteristics of Respondents with Role Performance : It is observed from Table 4 that the variables annual income, socio-economic status, source of information, economic motivation and scientific orientation were highly significantly related with the role performance at 0.01 per cent level of probability.

Table 4 : Coefficient of Correlation of Selected Characteristics of Respondents with Their Role Performance

S. No.	Variables	'r' value
1	Age	0.0493
2	Education	0.467*
3	Landholding	0.475*
4	Annual income	0.542**
5	Socio-economic status	0.551**
6	Experience in vermiculture enterprise	0.491*
7	Source of information	0.544**
8	Economic motivation	0.665**
9	Scientific orientation	0.552**

* Significant at 0.05 level of probability.

** Significant at 0.01 level of probability.

Education, landholdings and experience in vermiculture enterprise were significant at 0.05 level of probability with the role performance of rural women. This led to rejection of null hypothesis for education, landholding, annual income, socio-economic status, experience, source of information, economic motivation and scientific orientation. The age did not show significant correlation with role performance by rural women in vermiculture enterprise. Therefore, null hypothesis for this characteristic has been accepted. The findings of Alka Patki (1991) were found to be in conformity with these findings wherein they reported that variables, namely landholding and education were noted as significantly related with role performance of rural women in agriculture activities.

Nikhade *et al.* (1985) reported that similar finding with present study reported that income of the farmer had significant association with the use of fertilisers. Alka Patki *et al.* (2000) also reported significant relationship between the

source of information and role performance of rural women. The findings of Sheela (1991) also reported the present study with the observation of significant association between economic motivation and knowledge of dairy women about improved dairy practices. Alka Patki *et al.* (2000) also supported the results of the present study with observation of non-significant association between age and role performance.

Thus from above findings, it could be interpreted that the respondents with higher education, landholding, annual income, socio-economic status, experience in vermiculture enterprise, source of information, economic motivation, scientific orientation had higher level of role performance in vermiculture enterprise.

Multiple Regression Analysis : In order to ascertain the contribution of selected independent variables towards role performance by rural women in vermiculture enterprise, multiple regressions analysis was carried out and the results of this analysis are furnished in Table 5.

Table 5 : Multiple Regression Analysis of Independent Variables with Role Performance by Respondents in Vermiculture Enterprise

S. No.	Variables	Regression coefficient (g)	SE of 'b'	't' value
1	Age	0.3870	0.221	1.7466
2	Education	0.4287	0.3074	1.3779
3	Landholding	1.9698*	0.8962	2.1978
4	Annual income	0.00014*	0.000062	2.3114
5	Socio-economic status	0.4838	1.1452	0.4220
6	Experience in vermiculture enterprise	4.4441**	1.7405	2.5532
7	Source of information	2.4651**	0.9345	2.6378
8	Economic motivation	0.7513**	0.2832	2.6527
9	Scientific orientation	0.2298	0.2968	0.7142

$R^2 = 0.8783$, $F = 12.03^{**}$

* Significant at 0.05 level of probability.

** Significant at 0.01 level of probability.

All the nine independent predictor variables were fitted in regression analysis. The result presented in Table 5 showed that experience in vermiculture enterprise, source of information and economic motivation proved to be significant contributor at 0.01 per cent level of probability while landholding and annual income were significant at 0.05 per cent level of probability. The coefficient of determination R^2 showed that all nine independent predictor variables jointly explained 87.83 per cent of the variation in role performance by rural women. 'F' value for R^2 was also found to be significant at 0.01 level of probability. The unexplained variation, 12.17 per cent, may be attributed to

the factors not included in this study and also may be due to certain strenuous factors which were out of scope for the present study.

When the influence of an individual variable on level of role performance was studied, it was obvious that out of nine independent variables landholding, annual income, experience in vermiculture enterprise, source of information, economic motivation had significant contribution in role performance.

Constraints : The constraints faced by the respondents while performing the role in vermiculture enterprise are furnished in Table 6.

Table 6. Distribution of Respondents According to Constraints Faced by Them

S. No.	Constraints	Respondents	
		Number	Percentage
1	Lack of marketing facilities for vermicompost	22	88.00
2	No timely available subsidies from the government	18	72.00
3	Lack of effective schemes and facilities provided by Government	10	40.00
4	Poor economic condition of rural women for vermiculture enterprise establishment	13	52.00
5	Unfavourable attitude towards use of vermicompost in the field	15	60.00
6	Lack of knowledge of preparation of vermicompost	10	40.00
7	Lack of organic feed for earthworm species	8	32.00
8	Difficulties in handling earthworm while separation of earthworm from vermicompost	11	44.00
9	Lack of effective earthworm species in vermiculture production	5	20.00
10	Earthworm died due to adverse climatic conditions like high temperature	8	32.00
11	Earthworm are eaten away by enemies like birds, ants	14	56.00

It was noted that majority of the respondents faced the problem regarding lack of marketing facilities for vermicompost. It was stated by 88 per cent respondents, followed by no timely available subsidies from the government which was stated by 72 per cent respondents. Some other major constraints expressed by the respondents were

unfavourable attitude towards use of vermicompost in the field (60 per cent), earthworm are eaten away by enemies like birds and ants (56 per cent), poor economic conditions of rural women for vermiculture enterprises establishment (52 per cent).

Considerable majority of respondents expressed difficulties in handling an earthworm

while separation of earthworm from vermicompost (44 per cent), lack of effective scheme and facilities provided by the Government (40 per cent), lack of knowledge of preparation of vermicompost (40 per cent), lack of organic feed for earthworm species (32 per cent), earthworm died due to adverse climatic conditions like high temperature (32 per cent) and lack of effective earthworm species in vermiculture production (20 per cent).

Thus, it could be inferred that majority of the producers expressed poor economic condition, lack of subsidies from government, non-availability of poor marketing facilities, supply of organic wastes, and attacks by ants as major constraints.

Conclusion

It can be concluded from the study that majority of respondents were having high level role performance in vermiculture enterprise. As regards the relational analysis, independent variables, namely education, landholding, annual income, socio-economic status, experience in vermiculture enterprise, economic motivation and scientific orientation were found to be significant with role performance whereas age did not show significant correlation. The multiple regressions of all nine variables showed 87.83 per cent variation in role performance.

But the limitation of the present study was that the present study was carried with only 25 rural women of one village due to time constraints. Therefore, the results of the present study were only confined to the particular area.

Suggestions and Recommendations

Findings of the present investigation revealed that majority of rural women are performing important role in vermiculture

enterprise. The study suggests that systematic efforts on the part of extension agency are required to promote role performance of rural women about the practices like selection of inoculated earthworm culture species for vermiculture enterprise, preparation of beds/digging of pits for vermiculture enterprise, mixing of composting material so as to prepare feed mixture for earthworm, protection of earthworms from its natural enemies, putting/filling of vermicompost in gunny/ plastic bags for marketing and selling of vermicompost as well as its allied by-products. As the role performance of these practices were found to be meagre among them, it is necessary in this connection to arrange the field tours of rural women by extension agency to show rural women involving various practices of vermiculture enterprises.

Statistically, it is revealed that out of nine characters, education, landholding, annual income, socio-economic status, experience in vermiculture enterprise, source of information, economic motivation, scientific orientation with role performance and other characters like age did not have any relationship with role performance.

It means that as education, landholding, annual income, socio-economic status, experience in vermiculture enterprise, source of information, economic motivation and scientific orientation increases, role performance of rural women also increases. But in this study majority of the respondents were having semi-medium level of landholding, so it is necessary that extension agencies need to make more efforts to encourage small and medium landholding respondents about the role performance of vermiculture enterprise.

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PARENTAL EDUCATION AND FAMILY ASPECT OF SCHOOL ENROLMENT IN RURAL INDIA

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ABSTRACT

Universal access to primary education is one of the Millennium Development Goals (MDGs) to be reached by 2015. India has made elementary and free child education to achieve the Universal Elementary Education. Constitution of India states that all children up to age 14 years have a fundamental right to free and compulsory education. Despite several efforts, education for all has not been achieved in India. Furthermore, low quality of school and a high dropout rate, as well as gender and rural-urban disparities remain the major challenges of India. Child's performance in school not only depends on the school or teacher's quality but also on the family environment where the child grows. The study has used NFHS-3 data for all India rural states to analyse the factors responsible for child school enrolment and performance. We found that parents' educational status and family economic condition (household access to basic assets), parents survival are the important factors which are more likely to affect children's education.

Introduction

Education system provides a basis for the development of human capital. Universal access to primary education is one of the Millennium Development Goals (MDGs) to be reached by 2015. India has made elementary and free child education to achieve the Universal Elementary Education. Constitution of India states that all children up to age 14 years have a fundamental right to free and compulsory education. The Central Government has taken several initiatives in strengthening infrastructure and delivery of elementary education. Despite several efforts, education for all has not been achieved in India. Theoretically, school enrolment and dropout are determined by household's demand for education and the supply of education services. Demand for education is determined by parents' decision on the amount of schooling for their children, which is based on assessments of the

costs and benefits of education. The supply of education is determined by the access to and quality of local schools. In India, like other developing countries, household poverty is a major factor keeping many children out of school. Poor households often cannot afford to send their children to school or are forced to withdraw children out of school at early ages. Although primary school is almost free in India, hidden costs such as books, uniforms and food expenses hinder poor households from sending their children to school. Household size and family structure are also important determinants of children's schooling because a household's income and expenses are partly related to its size and structure. In addition, many households of the country are affected by unexpected economic and demographic shocks such as drought, food shortage, job loss, illness or death of an adult family member. These household-

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specific negative shocks have a detrimental effect on children's school enrolment and dropout. In this context, the paper analyses the household environment and parents' education on the child school enrolment. The broad objectives of the study are : (i) to examine the relationship of educational status (in terms of school enrolment, attendance and dropout) of children aged 5 to 14 years with family environment in India (ii) to examine the impact of parental education and household wealth level on the children's educational outcomes and (iii) to show the variation in educational outcome across Indian states.

Literature Review

Low educational achievement is a major problem in the Indian educational system. Many children, who enter the school, are unable to complete their education for various reasons. The following section will highlight the major factors which are responsible for low educational outcome.

Assets : A large set of literature on education achievement of the child suggests the importance of family economic resources in children's well-being (Becker, 1991, 1993; Becker & Tomes, 1986). Within this viewpoint, some researchers make a clear distinction between income and assets in terms of household resources. Sherraden (1991) highlights the importance of assets as more than a flow of income for maintaining the present and future consumption. Assets are important because they can bring economic security, especially in times of hardship or economic stress. Assets may also provide a position and signaling in the society, change the way people think, and expand the available opportunities (Oliver & Shapiro, 1995; Sherraden, 1991). Based on these arguments, assets may directly and indirectly enhance the welfare of children. Further, assets accumulation may help improve positive attitudes towards future orientation, and help people make specific plans with regard to work and family (Di

Pasquale & Glaeser 1999; Rossi & Weber, 1996; Yadama & Sherraden, 1996). Yadama and Sherraden found that savings and house values had positive links with attitudes and behaviours, such as prudence, efficacy and connectedness. These attitude changes then may lead to other positive social, economic, and inter-generational outcomes (Scanlon 2001). He suggested that assets might help people first shape hopes and plans, which in turn lead to positive social and economic outcomes. According to this view, parents with assets may perceive a brighter future for their children than those who do not hold any assets. This may positively affect parenting behaviours and investment and thus affect children's educational attainment. Several recent studies have examined possible independent and distinct effects of assets from income on children's education. Conley (2001) indicated that parental net worth had a strong effect on the post-secondary schooling of children and net of income and other measures of socio-economic background. Williams (2004) found that, parental wealth (net worth, account ownership and stock) was positively associated with educational achievement of children. Williams also found that the effects occurred even among very income-poor families. Similarly, Zhan and Sherraden (2003) found that low-income single mothers' assets (home ownership and savings) were positively associated with children's educational attainment. Furthermore, this study found that income was associated with educational achievement when assets were not in the model; however, the relationship between income and children's education disappeared when assets were included. Other studies have found that the wealth gap is strong in the enrolment of children across Indian states (Flimer, Pritchett, 2001).

Family Environment : Several studies are conducted to understand the relationship between family environment and child's outcomes, such as child behaviour, child education and child well-being etc. (Peterson &

Zill, 1986; Dubous et al., 1994; Salem et al, 1998; Wong, 1998; Carlson & Corcoran, 2001; Sun, 2001; Kamaruddin et al 2009; Kaur and Kaur, 2009). In a study by Dashore (1995), the socio-economic condition of girl child among tribes was studied. Study shows that the incidence of child labour is very high. Girls are forced to stay at home to care for younger siblings. Girl children get enrolled in school but are withdrawn early. The age and sex of the child affect his/her likelihood of going to school. In India there is evidence of discrimination against the girl child. Research done by University of Hull and Oxford University examined the factors that can affect how and whether girls participate in education by compiling results from India, Bangladesh, Sierra Leone, Cameroon and some other countries. The study revealed that pupils from bigger and poorer families were more likely to feel that going to school was more costly, and expressed negative views about the need for girls to go to school (Cammish and Brock, 1999). Tembon et al. (1999) studied the family level determinants of schooling of boys and girls in Guinea which indicated that parents' education and household wealth are the two important determinants of educational achievement of the child. They also found that mother's educational background has significant positive impact on the girl child school enrolment. There is evidence that in developing countries the cost of high fertility is borne by older siblings, rather than by parents (Emerson & Portela Souza, 2002).

School Quality: Dreze and Kingdon (2001) use data of 1143 households for rural north India to analyse the impact of school quality on school participation. They found that probability of participation increases with parental education, though mother's education does not have significant effect on male school participation. Among developing countries, India stands out in terms of the remarkably low levels of mobility in terms of educational achievement (see for example Gupta, 2004; Munshi and Rosenzweig, 2009) because of very poor quality of school

level infrastructure. Duraisamy (2001) studied the effectiveness of incentives on school enrolment and attainment in Tamil Nadu and found that school quality plays a major role in both supply and demand for education. If parents in poor rural households perceive the quality of their children schooling to be poor, they may be reluctant to send their children.

The review of various studies on child educational outcomes revealed that the focus has been on school quality and its impact on child educational outcome. However, there is hardly any study which shows the impact of family background, child status, and parental survival rate on child educational outcome

Methodology

Data for this study were drawn from "National Family Health Survey-3" (NFHS-3) conducted during 2005-06 in India. Three types of variables were considered for this study: a) Educational variables or outcome variables include educational status of child in terms of ever enrolment and current schooling and educational performance. b) Family environmental variables include child living status, survival status of parents, relationship with household head, parents' education status, parents' occupation status etc. c) Child characteristics and other socio-economic variables include child's age, sex, birth order, numbers of siblings, religion and caste etc. The paper has also included household access to basic assets to measure the household well-being. Household assets are defined as stock of financial, physical, human, natural or social resources that can be acquired, developed, improved and transferred across generations. In the current poverty-related development debates, the concept of assets or capital endowments includes both tangible and intangible assets, which broadly identifies as natural, physical, financial, human and social assets. However, in this study we have not incorporated the social assets because NFHS

data do not report the same. Natural assets include agricultural land and livestock which helps to maintain the sustainable livelihood of people in rural areas. Physical assets are generally defined as the stock of plant equipment, infrastructure and other resources owned by individuals, business and public sector. In this study, however physical assets include various types of consumer durables or household amenities and quality of house. Housing is the most important component of physical asset. The NFHS presents data on quality of houses based on the material used for construction of walls and roof separately. If both the walls and roof are made of pucca material, a house is classified as pucca. If the wall and roof are made of kutcha material the house is classified as kutcha. In all other cases the house is classified as semi-pucca. A wall is considered kutcha if the material used includes grass, leaves, bamboo, mud, un-burnt brick or wood. It is pucca when the material used is burnt brick, metal sheets, stone, cement or concrete. Similarly, a roof is considered kutcha if the material used is grass, leaves bamboo, mud, un-burnt brick or wood. It is considered pucca when the material used includes tiles, slate, corrugated iron, zinc or other metal sheets, asbestos, cement sheets, bricks, lime, stone and concrete. As proxy for standard of living within households we include quality of drinking water facility, toilet facility, type of cooking fuel, various household amenities such as electricity, television, radio, bicycle, watch, fan, water pump, and kitchen facility within household. A financial or productive asset comprises savings, credit, jobs and employment opportunities, and non-earned income used by people to achieve their livelihood objectives and to invest in new livelihood assets. However, NFHS data source is limited in scope for that information. In our study, productive assets count as financial assets because they represent a current or potential income stream. In the context of Indian rural States, sewing machines, tractor, thresher, animal

drawn cart are key indicators for productive assets.

Analysis of the Data

Construction of Asset Index: The paper has used the Multiple Correspondence Analyses (MCA) to create an asset index for all Indian States based on data from Demographic and Health Survey (NFHS) of India for the year 2005. MCA allows us to analyse the pattern of relationships of several categorical dependent variables (Asselin, 2002). There are several studies which have used the MCA score to generate the composite poverty index (Moser, C. and Felton, A. 2007, Filmer, D. and K. Scott 2008). The asset index value is given in the appendix.

The following equation is used to calculate a composite asset index for each household for each State

$$CAI_i = \frac{1}{K} (I_{i1}W_1 + I_{i2}W_2 + \dots + I_{ij}W_j)$$

where, CAI_i is the i^{th} household's composite asset indicative score. I_{ij} is the response of household i to category j and W_j is the weight which we will derive from MCA. K is the total number of primary indicators.

Factors Affecting Child's Education

Achievement: The paper has used the binary logistic regression model to find out the determinants of the child education status. The paper has run the three binary logistic regression models:

1. Child enrolment status: Here dependent variable is measured by 1 for enrolled child and 0 for never enrolled.
2. Child educational performance: Here dependent variable is measured by 1 for successfully passed in the 7th standard class and 0 for failed.
3. Dropout status of enrolled child: 1 for dropout and 0 for continuing.

Independent variables include child living status, parents' survival status, caste, religion, parents' education, parents' occupation,

household asset index, child age, sex, number of siblings etc.

Results

Constructing Asset Index (CAI): To construct the CAI for each household, the study has used the functional form of the CAI expressed in footnote 2. The weights (factorial scores on the first axis) attributed to the variable categories are presented in Appendix Table A1. There are 18 variables (primary indicators as in Appendix Table A1) and 41 categories demonstrates that the first factorial axis explains 71.6 per cent of the observed inertia (i.e., the eigen value) while the second axis accounts for only 6.58 per cent of the observed inertia (Appendix Table A2).

Weights with smaller or negative numbers indicate lower welfare; the larger numbers indicate higher welfare. To use these weights, the monotonicity axiom must be fulfilled, meaning that the CAI must be monotonically increasing for each primary indicator (Asselin, 2002 & 2005). The axiom means that if a household improves its situation

for a given primary variable, then its CAI value increases so that its standard of living increases. The largest positive scores are observed to be associated with goods and services comfort, whose access is limited to well-off households. The better-off the household, the more access it has to these goods and services, which include television, pucca house, piped water facility, flush toilet facility, modern source of cooking fuel such as LPG, sewing machine and literacy of household members. The categories associated with the largest negative scores on the first axis are the most accessible goods and services. The poorer the households, the less they possess such goods and services. These households may lack a bicycle, have no access to safe drinking water or a hygienic toilet. Before analysing the impact of asset index on child educational outcome, it is useful to start with the descriptive statistics of the asset index score (presented in Appendix Table A3). Figure 1 illustrates the distribution of asset index score. It is seen that asset index is mild negatively skewed which indicates mean asset index is lower than its median value.

Figure 1: Distribution of Asset Index Score

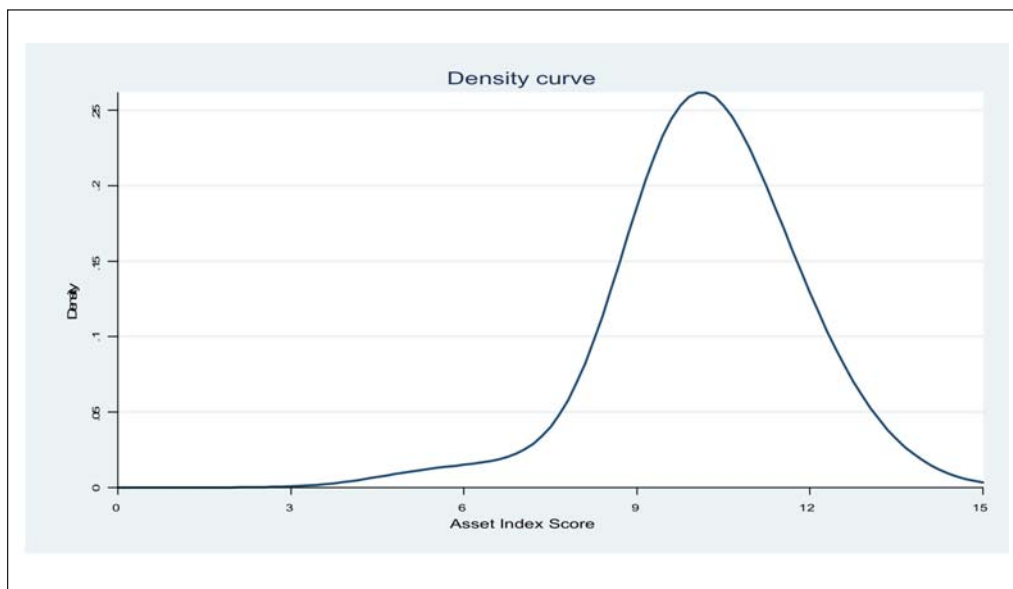


Table 1: Child Enrolment Rates by Asset Quintile

Asset Quintile	Q1	Q2	Q3	Q4	Q5
Enrolment rate	29	55	72	80	94

Source: Own calculation from NFHS, 2005 data.

Table 1 illustrates how child enrolment rate varies across asset quintile. It is easily seen that higher the asset quintile, higher the child school enrolment.

Table 2 illustrates that in most of the States there is a large difference in the enrolment rates between richest 20 per cent and the poorest 20 per cent of the asset index. The difference is highest in Jharkhand (60 percentage points) and lowest in Delhi (3 percentage points).

Table 2 : Difference in the Average Enrolment Rates Between Richest 20 per cent and the Poorest 20 per cent Using Asset Index

Andhra Pradesh	39
Arunachal Pradesh	45
Assam	29
Bihar	59
Chhattisgarh	55
Delhi	3
Goa	15
Gujarat	32
Haryana	35
Himachal Pradesh	10
Jammu and Kashmir	21
Jharkhand	60
Karnataka	45
Kerala	5
Madhya Pradesh	46
Maharashtra	22
Manipur	22
Meghalaya	32
Mizoram	34
Nagaland	37
Odisha	40
Punjab	38
Rajasthan	49
Sikkim	21
Tamil Nadu	12
Tripura	31
Uttar Pradesh	49
Uttaranchal	40
West Bengal	47

Source: Own calculation from NFHS, 2005 data.

Empirical Evidence on Child Educational Outcome: Figure 2 shows that there exists State level variation in educational status and performance of children. It is found that proportion of children ever enrolled in school is highest in Tamil Nadu (93.1 per cent) followed by Himachal Pradesh (91.4 per cent), Uttaranchal (91 per cent), Kerala (90.9 per cent) and it is lowest in Bihar (57.8 per cent) followed by Meghalaya (66.6 per cent) and Nagaland (68.8 per cent). Dropout students are found highest for Jharkhand (11.4 per cent) and lowest for

Himachal Pradesh (1.2 per cent). All India level 80.1 per cent children are ever enrolled in school and among them 6.1 per cent are dropouts (Figure 4). From Figure 3 it is noticed that proportion of currently attending students is highest in Himachal Pradesh (98.8) followed by Tamil Nadu (96.5), Uttaranchal (96.3), Mizoram (96.3) and Tripura (96.2). It is also found that proportion of currently attending students is lowest in Jharkhand (88.6) followed by Meghalaya (90.5).

Figure 2: % of Children (in Age Group 5-14 Years) Ever Enrolled in School

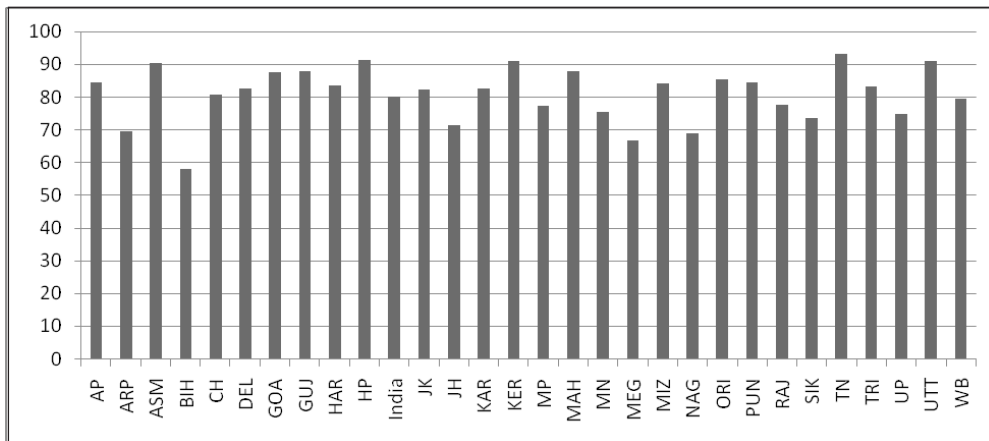


Figure 3: % of Children (in Age Group 5-14 Years) Currently Attending School Among the Enrolled Children

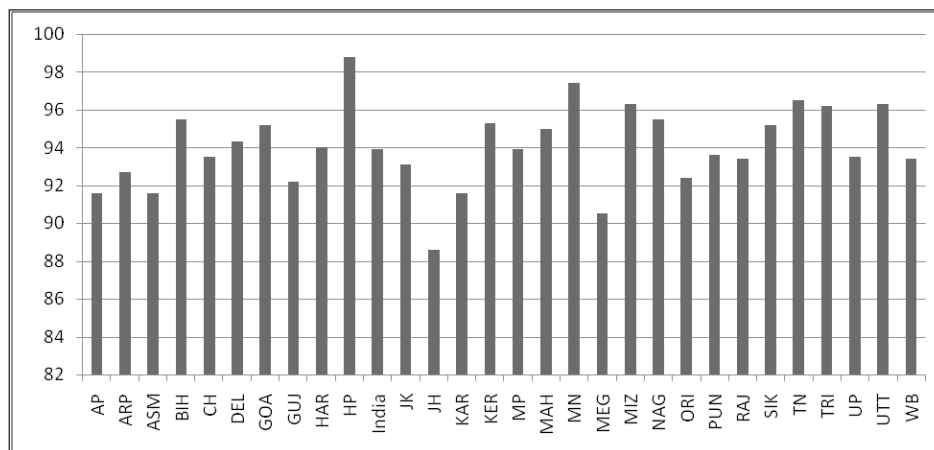


Figure 4: % of Children (in Age Group 5-14 Years) Dropout from School Among the Enrolled Children

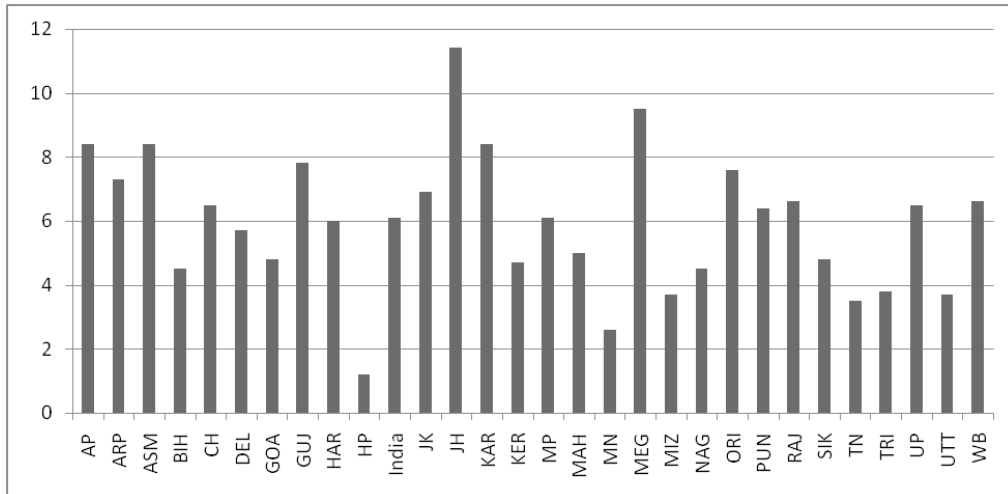
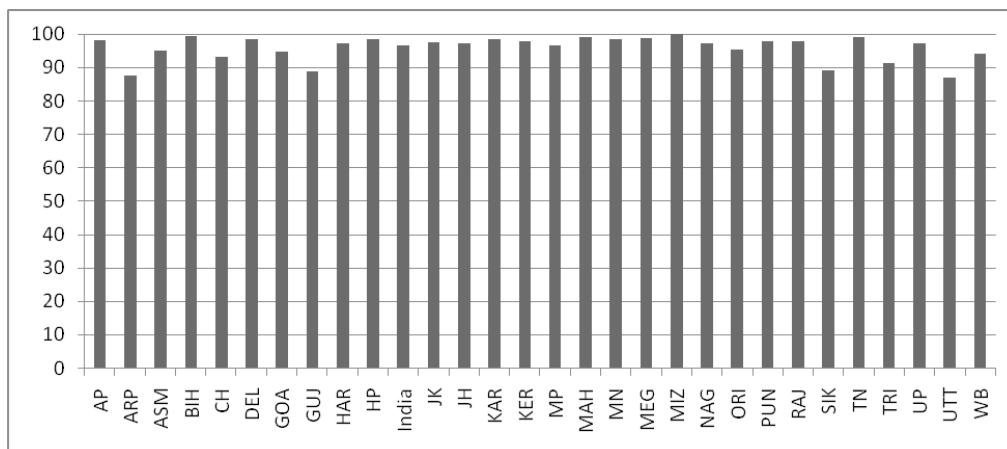


Figure 5: % of Children Passed in the Last Grade



From Figure 5 it is seen that among the children who are currently attending school, 'Percentage of children passed in the 7th class grade' has been found highest in Mizoram (100 per cent), followed by Tamil Nadu (99 per cent), and lowest in Uttaranchal (87 per cent).

From the above graphs it is clearly evident that there is wide variation across Indian States in terms of child school enrolment and performance. In this background this paper attempts to find out various factors that are responsible for child school enrolment in Indian States.

Table 3: Birth Order and Dropout of Sample Children

Birth Order	Dropout	% of Total
1	5334754	53.8
2	3481472	35.11
3	802196.3	8.09
4	188402.1	1.9
5	109074.9	1.1
Total	99159	100

Source: Own calculation from NFHS data 2005.

Results from Logistic Regression : It is seen that dropout is highest for the eldest child as they are for looking after the younger siblings or contributing to the household income by earning some extra money. We found that 53.8 per cent of dropout children happen to be first in the birth order, 35.11 per cent are second in the birth order and 8 per cent are third in the birth order (Table 3). From the profile of dropout children it can be concluded that older children, first and second birth order are more likely to dropout.

Factors Affecting Child Enrolment : Result shows that family environmental characteristics have significant effect on the child enrolment. Child living with mother whose father stays elsewhere has positive impact on child enrolment. It may be that father who stays elsewhere for job purposes generally helps the child to enroll in the school. However, child living with both parents is more likely to get enrolled in comparison to the child, living with a mother whose husband is staying elsewhere. Child whose relationship with household head falls in categories of 'son & daughter' is more likely to get enrolled than others. Children, whose both parents are literate, highly literate, either of the parent is literate, highly literate are more likely to get ever enrolled in comparison to the children, whose both parents are illiterate. Result also shows that children, whose both parents

are in secondary sectors and tertiary sectors, are more likely to get ever enrolled than the students, whose both parents are in primary sectors. It is also revealed from our analysis that if the household asset index is in the poorer quintile then it deter the child school enrolment.

Factors Affecting Child Dropout : Our result shows that children, living with a mother whose husband stays elsewhere or children living with single mother are more likely to dropout in comparison to the children, living with their both parents. Several factors come into play. Dropout is found higher for the children, where either of the parents is alive in comparison to the children; where both parents are alive (Ainsworth et al., 2005). Students whose both parents are illiterate have higher chances to dropout in comparison to the children, whose both parents are literate, highly literate, and either of the parents' is literate, highly literate. Dropout is found higher for the students who come from poorer asset quintile in comparison to the higher asset quintile. Parents' education and family economic condition are more significant on the child education outcome. Our analysis shows, if child has two or more siblings, parents are forced to drop out their child from the school.

Factors Affecting Child Educational Performance : We found that performance is higher for children who are living with both parents. One of the reasons could be that

students who are living with both parents can get good care which has positive impact on their performance. Performance is found higher for students, whose both parents are alive than either of the parents alive. Performance is found higher for the students, whose both parents are literate, highly literate and either of the parent is literate, highly literate in comparison to the children, whose both parents are illiterate. Performance among the currently attending students is likely to be higher for children, whose either of the parents is in tertiary sectors in

comparison to those children, whose both parents are in primary sectors. One of the possible reasons could be that of student's perception on education and parents' desire from the children. It means, students whose parents are in tertiary sectors working hard for their child education with an expectation to make their child educate and capable, may show better performance in education. Child coming from a wealthier family is performing better in comparison to child who comes from poorer family.

Table 4: Factors Affecting Child Educational Status: Results from Logistic Regression Analysis

	Enrolled	Dropout	Performance
Child living with mother whose father stays elsewhere	0.09***	0.03**	0.22**
Child living with single mother	-0.10**	0.10**	0.12**
Child of either parents alive	-0.02***	-0.07**	-0.02**
Relation with household head grandson	0.02	0.06	0.09
Other relations	0.78	0.12	0.06
Both parents literate up to secondary education	0.78***	-0.09***	0.89**
Both parents literate above higher secondary education	0.45***	-0.18***	0.20**
Either of the parents are in secondary education	0.34**	-0.32***	0.21***
Both the parents working in secondary sector	0.12**	-0.90***	0.21**
Both parents in tertiary sector	0.23**	-0.098**	0.15***
Both parents unemployed	-0.89***	0.78***	0.67**
Household asset index in poorer quintile	-0.12***	0.23***	0.34**
Household asset index in middle quintile	0.09**	-0.23**	0.08**
Household asset index in richer quintile	0.34***	-0.13**	0.16**
Household asset index in richest quintile	0.23***	-0.23***	0.12**
Child sex female	-0.12	0.23	0.23
No. of siblings 2	-0.12	0.21***	0.12
No. of siblings >2	-0.87	0.56**	-0.12
Religion/ Muslim	-0.56	0.34*	0.31
Religion/ Other	0.12	-0.02*	0.21
Scheduled Caste	-0.12	0.21*	-0.09
Scheduled Tribe	-0.08	0.04	-0.34*
OBC	-0.06	0.09	-0.21
General	0.23*	-0.80	0.78
Constant	0.56**	0.67**	0.78**
R ²	0.23	0.19	0.20
No. of Observations	128000	99159	70718

Note: ***, **, * indicates 1%, 5% and 10% level of significance.

For validating our findings we have used the simple ordinary regression model where dependent variable is proportion of enrolled child, dropout child and proportion of child successfully pass the grade 7 (Appendix Table A4). However, we did not find any different results. Significance and sign of the coefficients remains same, except the values of the coefficient changed.

Conclusion

1. There is wide variation across Indian States in terms of child school enrolment and performance. Some of the States like, Tamil Nadu, Kerala, Uttaranchal have more than 90 per cent children who are enrolled, whereas in States like Bihar, only 57 per cent children are enrolled.
2. There is a large difference in the average enrolment rates between the richest 20 per cent and the poorest 20 per cent of the asset index (Flimer et al., 2001).
3. It is seen that dropout is highest for the eldest child as they are for looking after the younger siblings (Emerson et al., 2002).
4. The interesting finding is that children, whose both parents are literate, highly

literate, either of the parent is literate, highly literate are more likely to get enrolled in comparison to the children, whose both parents are illiterate. Result also shows that children, those both parents are in secondary sectors and tertiary sectors, are more likely to get enrolled than the students, whose both parents are in primary sectors.

5. It is also revealed from our analysis that if the household asset index is in the poorer quintile then it deters the child school enrolment and increases the dropout rate.
6. Our finding reveals that if child has two or more siblings, parents are forced to drop out their child from the school (Emerson et al., 2002).
7. Child's performance is mostly affected by parents' educational status and parents' survival status.

So, the main crux of the paper is that parents' educational status and family economic condition, parents' survival are the important components of the family environment which are more likely to affect the children education, in the Indian context.

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Appendix
Table A1: Variables and Weights from MCA

Primary Indicators	Categories	Weights
Physical Assets		
Household Amenities	Has Electricity / No Electricity	1.366-0.391
	Has Radio / No Radio	1.601-0.805
	Has Television / No Television	3.012-0.915
	Has Bicycle / No Bicycle	0.843-0.75
	Has Watch / No Watch	1.196-1.849
	Has Electric Fan / No Electric Fan	2.414-1.178
	Has Water Pump / No Water Pump	2.64-0.145
	Has Separate Room for Kitchen	
	No Separate Room for Kitchen	0.648-0.677
House Type	Pucca House	2.487
	Semi -Pucca House	-0.579
	Kutcha House	-0.83
Source of Drinking water	Piped Water into Residence	2.327
	Public Tap or Public Handpump	-0.572
	Well Water	-0.368
	Rain Water	-0.249
Source of Toilet Facility	Flush Toilet	3.841
	Pit Latrine	1.609
	No Toilet	-0.701
Cooking Fuel	LPG	3.679
	Other Cooking Fuel	-0.335
Financial/Productive Assets	Has Sewing Machine	2.72
	No Sewing Machine	-0.52
	Has Tractor	0.492
	No Tractor	-0.77
	Has Thresher	0.655
	No Thresher	-0.55
	Has Animal-drawn Transport	1.085
	No Animal-drawn Transport	-0.182
Natural Assets	Has Land	2.162
	Has Non-irrigated Land	-0.321
	Has Both Irrigated and Non-irrigated Land	-0.089
	Has Any Livestock	0.10
	No Livestock	-0.019

Table A2: Dimension Specific Inertia from MCA Score

Dimension	Principal Inertia	Per cent
Dimension1	0.237	71.6
Dimension 2	0.021	6.58
Dimension 3	0.013	4.19
Dimension 4	0.008	2.69
Dimension 5	0.005	1.56
Dimension 6	0.003	0.78
Dimension 7	0.002	0.49
Dimension 8	0.001	0.31
Dimension 9	0.0007	0.21
Dimension 10	0.0004	0.15
Dimension 11	3.25E-05	0.01
Dimension 12	2.17E-07	0.00
Total Inertia	0.325	100

Source: Own calculation from NFHS data.

Table A3: Descriptive Statistics of Asset Score

Maximum	Minimum	Mean	Standard Deviation	Skewness
14.15	5.14	10.18	1.4	-0.78

Table A4: Factors Affecting Child Educational Status: Results from OLS Regression Analysis

	Enrolled	Dropout	Performance
Child living with mother whose father stays elsewhere	0.08***	0.13**	0.22**
Child living with single mother	-0.50**	0.80**	0.32**
Child of either parents alive	-0.12***	-0.17**	-0.32**
Relation with household head grandson	0.12	0.16	0.19
Other relations	0.78	0.12	0.06
Both parents literate up to secondary education	0.28***	-0.19***	0.79**
Both parents literate above higher secondary education	0.35***	-0.08***	0.28**
Either of the parents are in secondary education	0.30**	-0.33***	0.23***
Both the parents working in secondary sector	0.02**	-0.96***	0.26**
Both parents in tertiary sector	0.28**	-0.198**	0.10***
Both parents unemployed	-0.79***	0.77***	0.47**
Household asset index in poorer quintile	-0.02***	0.13***	0.35**
Household asset index in middle quintile	0.12**	-0.13**	0.18**
Household asset index in richer quintile	0.35***	-0.10**	0.86*
Household asset index in richest quintile	0.03***	-0.93***	0.72**
Child sex female	-0.10	0.27	0.26
No. of siblings 2	-0.42	0.25***	0.18
No. of siblings >2	-0.84	0.53**	-0.13
Religion/ Muslim	-0.51	0.33*	0.34
Religion/ Other	0.11	-0.12*	0.23
Scheduled Caste	-0.10	0.20*	-0.19
Scheduled Tribe	-0.18	0.14	-0.34*
OBC	-0.06	0.09	-0.21
Constant	0.26**	0.17**	0.48**
R ²	0.25	0.21	0.24
No. of Observations	128000	99159	70718

Note: ***, **, * indicates 1%, 5% and 10% level of significance.

BOOK REVIEWS

Irrigated Agriculture and Social Change: Evidence from Village Studies by Prof. Bishnu C. Barik, Vikas Publishing House Pvt. Ltd., New Delhi, 2013, Price : ₹ 295.

During India's Green Revolution period, few selected States showed keen interest in adopting seeds of High Yielding Varieties (HYV), modern tools and technology for improving the productivity and production of foodgrains. First few Five Year Plans focused on agriculture development by creating irrigation facilities such as construction of large and medium irrigation dams, construction of canals to reach water to the villages through which farmers cultivate crops and protect food security. In this process, certain villages enjoyed irrigation facilities through canal irrigation and some villages started exploiting groundwater by digging wells and bore wells. Another category of villages wholly depended on monsoons only. To capture the village dynamics across these broad typologies, several village studies have been carried out in India.

The book under review has been divided into eight chapters such as (i) Review of Literature: Towards a Theoretical Framework, (ii) Political Economy of Nanded District, (iii) Method and Formulation of the Study, (iv) Development of Irrigation, (v) Studied Villages, (vi) Production Process, (vii) Political Structure, and (viii) Irrigation and Poverty. One of the special features of this book is the exhaustive review of literature on "village studies" and "impact of irrigation and social change".

The author who is an eminent social scientist drafted the chapters very systematically which depicts theory intermingled with field reality (survey results). Though there are several studies on impact of irrigation and social change, this study stands out unique because of the variety of variables chosen for examination. The uniqueness of this book is to compile studies as

many as possible to highlight the importance of this subject. To mention few (i) S.C. Dube (Indian village), D.N. Majumdar (Rural Profiles), Mc Kim Marriott (Village India), M.N. Srinivas (India's Villages), Oscar Lewis (Village Life in Northern India), V. Dandekar (Study of Sugaon Village in Satara District of Maharashtra), A.B. Hiramani (Social Change in Rural India), T. Epstein (Yesterday, Today and Tomorrow), Krishna Murthy (Influence of Mettur Irrigation), Gurjeet Singh & Swaran Singh (Impact of Bhakranangal Dam on Irrigation), V.V. Borkar and M.D. Padhye (Socio-Economic conditions in command area of Purna Project in Marathwada), Divakar Jha (Direct and Indirect Benefits of Irrigation under Tribeni canal on Gandak river in Chaparam district of Bihar), Khan and Tripathy (West Godavari district of AP), Abdul Aziz (Hurisikote of Kolar district of Karnataka), G.P. Misra (Bellary district of Karnataka), R. Patil (Socio-economic conditions of farmers in the Ghod command area in Maharashtra), M. Bhattarai and N. Moorthy (Impact of Irrigation in India at regional and national level), Anand Chakravarti (Agrarian class relations), G.R. Sahay (Nature of Social formation in rural Bihar), Singh and Kaur (Study in Amritsar, Jalandhar and Sangrur districts in Punjab) to mention a few.

Interesting issues such as (i) Modes of Production Relations; (ii) Political Economy of the Area (Nanded); (iii) Development of Irrigation in Marathwada; (iv) Caste and Spatial Segregation; (v) Caste and Class Interrelations; (vi) Caste, Class and Land Ownership; (vii) Caste, Class and Sharecropping; (viii) Use of Agricultural Inputs; (ix) Class and Hiring services; (x) Caste, Class and Exchange of Labour; (xi) Women and Agricultural Production; (xii) Caste, Class and Income; and (xiii) In-and-out Migration, have been dealt in great detail.

The author tried to prove time and again tested hypothesis that irrigated areas have facilitated for better socio-economic

development, better education, better communication, better income, better exposure, less out-migration than unirrigated areas. It is also proved that better irrigation facilities tend to dominate certain segments of the farming community in the village political issues and discriminate lower castes on purity and pollution aspects.

The book is very useful to the scholars particularly young scholars as to how to carry out research study, prepare review of literature and present data and findings. The author has shown skills of social science discipline and showed excellent academic pursuit.

Dr. K. Suman Chandra

Issues and Perspectives in Anthropology Today, Edited by R.Siva Prasad and Eswarappa Kasi, Serials Publications, 2013, Price : ₹ 995 pp.264.

Anthropology is multi-dimensional in its approach and embraces the multiplex human events centralised on the bio-genetic as well as socio-cultural perspectives. 'Anthropology Today' is a conglomeration of different notions and ideas, which are inherent in the changing nature of the disciplines across the places.

The theme of the special issue of 'Man in India' (January-June 2009) was 'Issues and Perspectives in Anthropology Today'. The special issue covers broad themes from theory to empirical understandings of the discipline. This book is an extension of the special issue of 'Man in India' on 'Anthropological Perspectives'. Those papers which could not be included in the special issue are brought together and they became part of the current book.

In this book, diversified socio-economic, religio-cultural, ethno-political, eco-environmental as well as bio-psychical pattern and perspectives that have influenced the human society as a whole and which have molded the thought-patterns and action

orientation of the people in the different cultural levels have been explored. Altogether nineteen papers have been included in the book. Different papers emphasise on various trends of human behaviour in the different geo-environmental, socio-political and ritualistic settings. Some of the papers focus on the nutritional problems, health culture, human group identity formation, ageing and globalisation.

The paper on migration brings out how migrants make place in host communities by inscribing these places with parts of their culture. Data are drawn from fieldwork carried out among migrants from Karnataka. The paper on health sector reform policy discusses about the cultural issue of health care seeking behaviour in Bangladesh. It discusses how social structures particularly people's beliefs, perceptions and attitudes on illness influence the primary health care seeking behaviour.

In another paper, the concept of nutrition transition has been used to explain the shift away from a diet high in fibre and common carbohydrates towards more energy-dense diets that are high in sugars, refilled foods, and saturated animal fats as well as a move towards a more sedentary lifestyle. The paper on ageing brings out how the societal- familial and economic problems of older people vary from culture to culture, society to society. It discusses how as a result of different expectations, values, cultures and socio-economic background, the older members of a tribal group experience the life cycle in a different way than the mainstream culture.

In yet another paper, the impact of drought on the economy, ecology and culture in a tribal social setting is discussed by establishing the interrelationship among them and finds that drought not only affects the economic conditions of the people and causes degradation of natural resources but also vividly influences their socio-cultural practices. In another paper the

importance of the Sun Goddess festival of Bhojpur region called *Chhatha Puja* in which rituals record the motive of fertility and prosperity of the family is discussed.

The paper on the tradition of worshipping feminine divinities which is as old as ancient culture is analysed in relation to the Kamakhya temple located in Guwahati. In India, the system of goddess (devi) worship and pilgrimage to their seats' (shaktipithas) are one among many ancient living traditions. Another paper portrays the muslim women's status in Delhi. The paper tries to investigate Muslim women's perception on the religio-cultural indicators (inheritance of property, Mehr system, dowry continuation) and non-cultural indicators (education and paid work participation) associated with their status enhancement.

One of the articles discusses about the hazardous condition of nutritional status of the Santal Tribe of West Bengal and brings out the malnutrition situation in West Bengal. It emphasises how malnutrition and under-nutrition constitute a serious hazard to the growth and development of people, particularly children. One of the papers is a case study of an intra-caste conflict among Khatiks in Bhopal, India. It spells out the features of a local leadership competition that is tied to a struggle over the re-interpretation.

One of the papers gives an account of democratic decentralisation and participatory planning in Kerala. In another paper an anthropological analysis of the relationship between water as a natural resource and human societies is attempted.

Eswarappa Kasi's paper focuses on the sociological understanding of the development of sericulture in India and how sericulture with its vast potential for employment generation in rural areas plays a vital role in alleviating rural poverty and unemployment. The paper explores studies made earlier in the areas of sericulture in India general and Andhra Pradesh in particular.

Pushpesh Kumar's paper attempts to explore the reasons behind the collapse of income-generating schemes initiated by Tribal Development Department of the Government of Maharashtra to improve the socio-economic condition of Kolams who are considered as the most 'primitive' and impoverished tribal community.

These papers on various sub-themes of Anthropology will be of interest to development practitioners, students of anthropology, policy makers, and other professionals concerned with Tribal Development.

Dr.N.V.Madhuri

Indigenous Institutions, Social Capital and Sustainability in Tribal India, by Tabang Mibang, Serials Publications, 2013, Price : ₹ 995 pp.274.

Social capital is considered as an essential element in the realm of social coherence, stability and solidarity. In the recent years, the concept of social capital has gained intensive attention from both academics and policy makers. The core of social capital concept represents the presence of dense networks of formal and informal associations and the accompanying norms of generalised trust and reciprocity. Just as human and physical capital, social capital has been brought forward as an important resource available to societies. It is also considered to have an important influence on the performance of societies at the economic, social and political level which allows people to overcome collective action problems more effectively at lower cost, resulting in better performance, participatory democracy, empowerment from below and effective government.

This book is a study which applies the concept of Social Capital in the context of Arunachal Pradesh which is enriched with intensive social networks, trust, mutual reciprocity and social commitment within the

groups which are reflected in observance of various socio-cultural festivals and rituals. The study is an attempt to examine the trajectory of social capital in Arunachal Pradesh with specific reference to *Adi* society - one of the ethnic groups of Arunachal Pradesh. Apart from the participant observation of an insider, the study is based on the responses of 440 respondents, selected from ten administrative circles of East Siang district.

The author brings out that the social ties, the fellow feelings, the support system, the social trust and inter-connectedness is gradually slipping away and individual preoccupation is making inroad into social domain of Arunachal Pradesh. He also reveals that important social pre-requisite of a vital democracy like voluntary and intensive participation in various activities related to social development, strong positive values and ties that bind people to one another leading to more powerful norms of generalised reciprocity and cooperation are also eroding.

The study reveals a significant change in associational life, access to different resources, livelihood possibilities and local socio-political relationship over the last few years in the society of *Adis*. The changes are reflected in emergence of the new social capital (associations and organisations) in the form of youth association, student's association, farmer's group, self-help group or small saving and non-governmental organisation pertaining to emerging issues like health, gender, environment, education, etc. The changes in the changing perception, attitude and thinking process of the people are also revealed in the study with regard to some important customary practices and other social issues like marriage, ritual and ceremonies, social taboos and restriction etc.

An attempt has been made to understand the effect of casual factors behind the change in various levels of social capital and the state of social capital at present. At the same time, the study also attempts to suggest remedial

measures. In brief, the study is an attempt to understand the process of traditional social capital in transition, continuities and discontinuities due to emergence of new social capital.

The author concludes that traditional institution based on traditional norms of solidarity and reciprocity are more inclusive and effective in generating fellow feeling, belongingness and trust among the people in the village and they govern access to community controlled natural resources that provide sustenance, social security and social safety net for those who are in crisis. In short, the study reveals the forging of a new synthesis between the old and new without major or revolutionary emotional disturbance or turmoil in the institutional and inter-group behavioural pattern of the society.

Providing a comprehensive and analytical view of various issues of social capital, this book will attract the students, researchers, academicians, policy makers and social anthropologists interested in tribal issues.

Dr.N.V.Madhuri

Economics in Action, by V. Santhakumar, Sage Publication, 2013; Pages 351, Price : ₹ 545.

The quest for development has become the dominant aligning pursuit for most of the world. People may have starkly differing views on what kind of development is desirable. They usually disagree on how it may happen, and they could have divergent views on its implications, but what they will have in common is the pursuit of development. And willy-nilly this pursuit makes all of us use the concepts, frameworks and assumptions of Economics. This usage of Economics is often unconscious, picked up from here and there.

Understanding relationships alone is not sufficient for development practitioners. They should be able to infer, by reading such material, what they can do to better development

outcomes in the context in which they are working, informed by theory and empirical research. Thus, the focus of this book is on action. However, there are different levels of action. Changing or redesigning the economic policies of the country is also an action and it is expected that these will be carried out by those who have a more complete career/education in Economics. This book does not address them. Instead, it addresses the requirements of two other realms of action.

- One, many people including development practitioners (politicians, NGO volunteers, civil society activists and government officials) participate in public debates on policies. Some understanding of economic imperatives and implications is extremely useful to make such public debates insightful and meaningful. This book is a modest attempt to contribute such knowledge to the participants of public debates.
- The second domain where this book may be useful can be called 'micro action'. This is where specific development interventions are designed and implemented. For those involved in the design of a village water supply project, a waste cleaning mechanism

in a semi-urban area, in making the local government effective, in ensuring attendance of children in schools and so on, some insights of economics may be useful to them.

Some of us had a formal exposure to the field of Economics and may therefore, be more conscious of our unstated assumptions and more cautious in drawing summary conclusions. While sometimes a brief exposure to any field may give a false sense of confidence and lead to its foolhardy usage, on the whole, people are better off with some exposure, rather than none.

Santhakumar's book is an attempt to provide such an exposure to Economics to the average development practitioner. The book is divided into 6 sections and 22 chapters and is reasonably priced at ₹ 545. It succeeds substantially in this attempt because of three reasons. First, it gives a comprehensive, end-to-end view of the field (as much as is possible in a slim volume). Second, its language is English, not Mathematics, which often seems to become the default language of Economics. Third, it uses the context of our here-and-now, not some distant past or unknown future.

Dr. G.V. Krishna Lohi Das

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