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A Review**

**INSTITUTIONS AND AGRICULTURAL
DEVELOPMENT**

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Friday 9 July 2004, 8–12 & 13–18

Papers/Abstracts Submitted

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Rural Credit Delivery System in Maharashtra: A Step Towards Rejuvenation
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New Institutions in Irrigation Sector: Their Trajectories and Impact on Rural Economy (Abstract only).
- R.S Deshpande, Neelambar Hatti and Amalendu Jyotishi, Institute for Social and Economic Change,
Bangalore, Department of Economic History, Lund University, Lund and Gujarat Institute of
Development Research, Ahmedabad.
Poverty in India: An Institutional Explanation.
- Thijs Wissink Bhutan
The impact of trade liberalisation on agriculture in Bhutan (Abstract only).
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From Training and Visit Extension to Farm Women Groups: Impact - in terms of economic benefits and
empowerment - of four Danida-supported training projects for farm women.
- R.V.Dadibhavi , Professor, Dept of Economics, Karnatak University, Dharwad.
Institutions for Management of Common Property
- A. Rajgopal, Visiting Fellow, National Institute of Rural Development, Hyderabad.
Dynamics of Water Institutions and Agriculture under a South Indian Canal Irrigation System
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Rubber small-holders in Kerala, (Abstract only).
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The "Gene Revolution" in the Era of Globalization: Changing Agra , (Abstract only).
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Irrigation Institutions in India: With Special Reference to Maharashtra State

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Institutional Analysis of Swidden: The Case of Swiddners in Orissa
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Institutions And Rural Development – A Case Of Sericulture Quality Clubs
- Golam Rasul and Gopal B. Thapa, School of Environment, Resources and Development, Asian Institute of Technology, Thailand
Implications of Changing National Policies on Land Use in Chittagong Hill Tracts of Bangladesh
- Koichi Fujita, Associate Professor, Center for Southeast Asian Studies, Kyoto University, Japan, TEL: +81-75-753-7321 FAX: +81-75-753-7350, Email: kfujita@cseas.kyoto-u.ac.jp
Transformation of Groundwater Market in Bengal: Implications to Efficiency and Income Distribution
- M N Panini, Professor, Jawaharlal Nehru University, New Delhi, India, 110 067. E-mail mnpnani@del3.vsnl.net.in
A Study of Social Implications of the Introduction of Genetically Modified (GMO) Crops in Indian Agriculture

A Review of the Papers

Introduction

Institutions play a significant role in Asian agricultural development. Institutions in agricultural sector in most of the countries were shaped historically to minimize varieties of uncertainties, reduce the problems that are intrinsic to the sector and finally forge the development of the sector. Therefore, these forms play a vital role in any analysis of the South Asian agriculture. Interestingly, in recent years institutional analysis has gained substantial importance with the recognition of property rights and transaction cost schools of thoughts. With the advancement of theories on these lines, the institutional approach started gaining importance in understanding the development process. In south Asian countries agricultural institutions have a long history, starting from the traditional form of shifting cultivation to modern capital-intensive agriculture. This also poses certain questions on the factors that have compelled such changes and transformation. Organization of a systematic framework therefore, requires grouping these in four basic forms namely institutions associated with inputs, production, exchange, and social system. Composition of inputs in agriculture has undergone drastic changes over a period of time. Institutions in South Asian context developed often to regulate labor and route the other inputs. In recent years agricultural inputs have substantially increased from land labor to various forms of seeds (HYV and GM), fertilizer, pesticides, insecticides, various instruments like tractors etc., and consequently the role of institutions has changed. Institutions associated with production help to enhance the productivity of the system with the improvement in technology and reduce uncertainties associated with the production system. Exchange as an integral form of market institution has undergone changes in various forms. In the context of liberalisation in the World these forms have received added attention.

Institutions are generally categorised into formal and informal institutions. The formal institutions are largely governed by the pre-decided legal setup in the form of formal norms. In certain circumstances these norms are flexible and can change over time, whereas, in other circumstances these can be static in nature. Therefore, one gets two kinds of categories one is the dynamic characteristic of the institution whereas the other is a static one and inflexible in nature. The informal institutions, on the other hand, emerge out of the spontaneous requirements based on the needs of the society. Here again some of the institutions may have a structure that may not change over time; in certain cases the informal institutions can be very flexible. Agriculture being a subject very close to the cultural setting and sensitive to the changes in society largely, flexible informal institutions are more effective in agriculture. It is interesting to observe the changes that have taken place in the institutional structure, especially after independence. The institutional structure has changed due to various factors, mainly concerning technology, process of commercialisation, and organisational structure.

The profile of development is influenced and also determined by the institutional set-up. Institutions shape human interaction, define the choices and decisions made by individual, community or society to achieve a satisfactory life style under the given environmental constraints. Thus institutions play a significant role in shaping and regulating human activities to optimize production and to minimize the risks associated with production system. Any development process presumes three levels in achieving its goal. Of these, the first stage begins at the preparation for the process of development that essentially requires inducing growth in the first place. Availability of investment and

resources for achieving such growth is an important component at this stage. The second step is to ensure the quality of growth and its structural placement. In other words, the two stages together involve identifying the weak and strong spots of the economy and ensure that the resources are directed in proper direction. The third stage is a crucial one, which translates growth into development through a conduit of either existing or newly constituted institutional structures. This transfer remains only as a component of the growth process but the role of institutions is quite crucial. Thus the failure of translation of growth into development rests on the fulcrum of institutions. This has been brought forth historically in different case studies by North and Thomas, 1970; North, 1990. Institutions in general understanding are the rules governing any social and economic process. These can be formal institutions initiated and directed by the state or informal institutions established by the stakeholders or emerging through cultural dynamics. In the context of irrigation, institutions include laws and policies of the government, administrative arrangement for operation and maintenance of the irrigation systems, land, labour and capital use in the irrigation systems and interface of the stakeholders in terms of informal institutions. It is a clear therefore, that the complex of institutions governing irrigation sector has three different actors. Among these we have the state and state governed laws, the interdepartmental linkages in administering irrigation (Revenue and Irrigation Department) and private property regimes in terms of land ownership and tenancy contracts. In this entire framework the institutions intervene exactly like technological parameters in shifting the production function upwards, but unlike technological change, institutions do not alter the physical quality of resources. Institutions generally interface with resource allocation, the formal government laws, and the stakeholders. Such interface essentially creates a kind of reaction depending on the property regime, the people involved, and the state control. In addition to this, the natural resource use parameters also influenced the making of the institution. Institutional theory from the angle of production economics helps in answering many of these pertinent issues where an interface occurs between state initiated structures and the user groups. Focusing on costs and benefits, incentives and penalties, to individual actors, institutional analysis demonstrates the economic rationality of co-operation and possibility of co-operative equilibrium outcomes from competitive games (Ostrum et al.1994, Sengupta, 1991). Moreover institutional-economic analysis provides answers to some important questions. I.e. " What are the conditions wherein individuals realize the necessity of collectiveness and under what conditions they will co-operate?" For example it helps to predict the conditions under which farmers are willing to go in for collective action as regards the management of irrigation water resources. Institutional economic analysis therefore offers the possibility of the kind of prediction and generalization of the theory of co-operative action which developmental agencies require in generating predictable outcomes from planned inputs.

Historical Evidence of Institutional Interventions

There is an overall agreement that institutions strengthen the transformation process towards overall development. It has been an experience since the beginning of this century that institutions have played an important role in enhancing growth, attaining better distribution, and creating an atmosphere towards increased economical welfare. In the early part of this century the formation of institutions essentially with the state initiative was not as common as it became after the independence. Cooperatives, labour institutions and legal framework were made stronger during those days. However, during the pre-independence days the informal institutions were quite strong. These included social institutions like caste, family, village religious groups, sect groups and other such institutional bodies. Traditional village institutions also played a very significant role. Among the village institutions, land ownership rights, village functionaries and their economic rights, social hierarchies depending on economical hierarchy were the prominent ones. Similarly, the traditional

institutions governing natural resource were also quite significant. In the post independence period, initially the community development institutions at village level were established and the development process towards the village passed through the Community Development network. This was followed by a strong initiative towards obtaining an egalitarian land distribution through a series of reform measures in the land market. Thus land reform came up as a recognised institutional intervention. The evidence shows that we achieved mixed results on land reforms across the States. Whatever may be the measure of success, it is quite clear that land reforms could obtain the complete elimination of intermediaries and protected the tenants. Though it could not achieve the distribution of the land acquired the reforms succeeded in changing the agrarian structure to a large extent. Close on the heels of land reforms were the reforms in the rural credit structure as well as the price policy reforms. All these led to a sea change in the rural institutional structure. The traditional village institutions managing natural resources including water, land, and village level operations were quite prominent.

We received more very good response from the academicians and had to restrict our choice to 15 good papers based on the abstract. After making the choice of the papers on the basis of the abstracts the interested participants were asked to send full papers. WE have received 9 full papers and the rest in the abstract form. It is not quite sure that all the paper writers would make to the conference but their ideas did reach here in full measure. We respect the ideas and ignoring the absence of a few paper writers reviewed here their views. Broadly speaking the papers fall in to five groups as given below:

I. Water and Irrigation Related Institutions

- Koichi Fujita,
Transformation of Groundwater Market in Bengal: Implications to Efficiency and Income Distribution
- R. Parthasarathy,
New Institutions in Irrigation Sector: Their Trajectories and Impact on Rural Economy (Abstract only).
- A.Narayanamoorthy, R S Deshpande,
Irrigation Institutions in India: With Special Reference to Maharashtra State
- A. Rajagopal
Dynamics of Water Institutions and Agriculture under a South Indian Canal Irrigation System

II. Land Management Related Institutions

- R.V.Dadibhavi ,
Institutions for Management of Common Property
- Amalendu Jyotishi
Institutional Analysis of Swidden: The Case of Swiddners in Orissa
- Golam Rasul and Gopal B. Thapa,
Implications of Changing National Policies on Land Use in Chittagong Hill Tracts of Bangladesh

III. Economic Institutions

- Deepak Shah,
Rural Credit Delivery System in Maharashtra: A Step Towards Rejuvenation
- Thijs Wissink

- The impact of trade liberalisation on agriculture in Bhutan
- Jatinder Bir Singh
Futures Markets and Price Stabilization - Evidence from Indian Hessian Market
- Balz Strasser,
Rubber small-holders in Kerala, (Abstract only).

IV. Technological Interventions and Institutions

- Steen Folke,
From Training and Visit Extension to Farm Women Groups: Impact - in terms of economic benefits and empowerment - of four Danida-supported training projects for farmwomen.
- Kumbamu Ashok,
The "Gene Revolution" in the Era of Globalization: Changing Agra , (Abstract only).
- M N Panini,
A Study of Social Implications of the Introduction of Genetically Modified (GMO) Crops in Indian Agriculture

V. Socio-Political Institutions

- Vinod Vyasulu,
Agriculture and 73rd Constitutional Amendment: Institutional Challenges, (Abstract only).
- R.S Deshpande, Neelambar Hatti and Amalendu Jyotishi,
Poverty in India: An Institutional Explanation.
- D.V. Gopalappa
Institutions And Rural Development – A Case Of Sericulture Quality Clubs

Water and Irrigation Related Institutions

Water being a common property resource has its own problems of uncontrolled use rates. Usually there are two solutions recommended to control the use rates of water, be it for irrigation or for drinking purposes. The first one is the economic and market centered solution, emphasizing proper pricing of the use of resources to control the uneconomic use. Here the argument focuses on applying progressive water charges to discourage the use of excess water. The second solution emanates from institutional approach, advocating the user management of water use. Collective action is recommended to deal with the problem of mis-use of resources. There are four papers dealing with the operations of institutions dealing with management and distribution of water. The first two papers deal with water users' associations in surface water irrigation systems. Among these the paper by R Parthasarthy deals with Irrigation Management Transfer (IMT) wherein, Managerial and financial responsibilities for the public schemes being handed over to organized Water User Associations (WUAs), with a view to improve water rights of farmers and improvising the use efficiency of the infrastructure. However, the mode of IMT, as implemented till now, appears to work only in non-poor, high-performing, business-like agriculture. In schemes in the middle- and low-income countries with a heterogeneous composition of farmers in the command areas, IMT could only succeed where farmers with the largest holdings became the "champions." In some places, withdrawal of state support has led to partial or full collapse of the scheme, with negative consequences for productivity. The paper argues that IMT could have been successful if the process had been right, that is, if it had been more gradual, with more emphasis on institutions. This would have led to a better definition of water rights. These and other factors have also impacted on the extent of participation of users in the newly set up programme; some would argue that extent of participation has also impacted the expected results of

the IMT programme. In second paper on Dynamics of Water Institutions and Agriculture under a South Indian Canal Irrigation System, Dr. A. Rajagopal deals with an interesting situation of sustained water distribution organizations in South Asia in a Canal command system over a period of 15 years. After a resurvey it was found that collective action both in the appropriation of water from the main canal and allocation of water at the local level is quite significant. Despite significant changes in the land control parameters the villagers continued to show interest in the collective action. But at the same time caste as a social institution plays a significant role in the process. The other two papers deal with the ground water situation through institutional management system. Narayanamoorthy and Deshpande's paper highlight the role of institutions in the groundwater irrigation systems. While Kochi Fujita deals with the transformation of groundwater market in Bengal with the implications to efficiency and income distribution, Narayanamoorthy argue for the institutions like Pani Panchayats in southern Maharashtra. The introduction of SMs in West Bengal is not a fundamental solution to the problem of declining water table. Market is not enough to solve the problem and needs to be supplemented by some kind of community level coordination and government regulation. The same is the above- mentioned problem of inefficient resource use arising from excess investment in tubewells. The transfer of DTWs from the state government to farmer's group now under progress in West Bengal also needs some non-market institutional mechanism. It is true that because of the individual farmers' initiative groundwater irrigation (especially STWs) achieved a widespread and rapid progress and contributed to the agricultural development in Bengal since the 1980s. However, it is high time to re-evaluate the role of the government and the community in minor irrigation sector.

In any institutional setup the sustainability of the institution relates directly to the process of optimising its effective components. As we have mentioned above the stakeholders in the formation and sustenance of the institution here involve the state department of irrigation, the beneficiaries who directly benefit out of irrigation, the individuals who are not the members of the institution but also receive and depend on the same resource, other social and financial institutions and the conditions of the market in the region. The optimality of gains will require a clear computation of who gains from the formation and sustenance of institution and how such gains are spread over the stakeholders. It is the optimal solution in terms of balance between the positive and negative externalities that decides sustenance of the institution. Sustainability automatically ensures optimum gains to its partners. We hypothesise here an existence of an inverted U type of relationship between water scarcity and returns to organization. It needs to be seen if such condition is satisfied in the empirical examples.

Land Management Related Institutions

Land in most of the south Asian countries is not only a means of production, fixed asset but also an indicator of social position. Land markets therefore, do not follow the dictums of the commodity markets. Similarly, the land related institutions also have a culture that is different than the other economic institutions. These could be technically classified by the land use categories. The cultivated land gives rise to institutions like collective farming, cooperative farming and contract farming. Whereas the uncultivated land that falls under private and public ownership is dealt with similar village level informal and formal institutions. In this context sustainable use of common pool resources and management of village commons have received increased attention and the need for institutional reforms ensuring stakeholder's participation and equitable distribution of benefits. The paper by Dadibhavi on Institutions for Management of Common Property Land Resources (CPLRs), makes use of the available evidence and with the help of a micro level study draws lessons for the development of commons requiring collective actions. Commercializations of resources and conflicts arising due to increasing scarcity of natural resources have further complicated the management

problem. Besides these, distorted policies, breakdown of traditional social institutions and lack of alternative institutions are responsible for the degradation of the commons. Similarly breakdown of village level social institutions led to degradation of common lands, irrigation tanks and village forests, etc. The study attempts to examine the changing size of CPLRs in Karnataka (a South Indian State), to bring out the impact on the livestock economy and highlight the contributions of CPR's to the household economy. The study is based on both Primary and Secondary level data. Primary level data are collected through sample household survey of 1021 poor and 347 non-poor households in 15 villages, spread in four regions of Karnataka state in India during June 1994 to July 1995. It comes out clearly that CPLR's have declined over the last 30 years and illegal encroachment is responsible for this decline. Despite the failure of legal formal institutions the CPLR's contribution to the rural household even today is significant to both poor and non-poor in regard to the fuel and fodder requirement, income and employment. The study comes out strongly in favour of effective management of CPLR's with the help of village level local institutions. The village communities and NGO's could play a crucial role in overcoming the problems of the CPLRs.

Swidden (shifting cultivation) has been a widespread form of land use that varies in character through space and time. It has been specifically associated with certain areas and communities. The process of swiddening therefore is strongly governed by the local informal institutional norms. Due to ethnic and ecological diversities as well as in terms of cropping pattern, frequency of land use, tools and methods of practice, institutions play a vital role in shaping and regulating the process of swiddening. It is argued in the literature that the institutions governing swidden are static in nature and do not adapt to the requirements of the changing ecological and social needs. There are a few aspects, which underscore the institutional face of swidden. First, the nexus of population growth and swiddening activity needs to be understood, to know whether the carrying capacity of this system to continue for time infinitum. In other words, carrying capacity analysis would provide a comprehensive understanding of adaptability and the coping mechanism of the swiddeners to sustain their system of production through institutional means. However, it is not a necessary condition that the changes in agricultural institutions are guided by the population factor alone. There are other forms of institutions that help us in understanding whether the system of production of the swiddeners is static or not. These include, land-use choices vis-à-vis property right structures and labour sharing arrangements, integration with market and the forms of integration, changing technology that depict the economic interface with institutions. Development and changes in the customs and norms are a few of the analytically complex changes to be noted while analysing the institutional changes in swidden. Considering these factors, the paper attempts to understand whether swidden system is institutionally static or, there are changes observed in the system. Based on the field survey in five swiddening villages of Orissa, we find varying characteristics of changes in the above-discussed institutions that call for a comprehensive understanding of the development processes.

The third paper in this section deals with the formal legal institution in terms of an analysis of the land use policies of a South Asian country (Bangladesh). Land use in the Chittagong Hill Tracts (CHT) of Bangladesh had undergone changes over past several centuries. The forest area was gradually declining, while the area under shifting cultivation and other types of sedentary agriculture had expanded. The process of the change was multi-directional. National forestry, land use, land taxation and population migration policies, and development activities, such as construction of a hydroelectric dam and roads, played an important role in this process. Shifting cultivation had inflicted little damage on the forest until the beginning of the colonial period. The pace of deforestation accelerated with the

nationalization of forest that abolished tribal people's customary use and management rights to forest, and allowed large scale commercial logging both legally and illegally. The pace was further intensified by the policy, encouraging population migration to CHT and construction of a reservoir on Karnafuli River. Efforts were made to replace shifting cultivation with more productive type of sedentary agriculture. However, much change could not take place in the absence of secure land rights, supportive trade policies, and required support services and facilities, including infrastructure. Locational suitability of land use had evolved in areas where transportation facilities were available and farmers were granted land title with necessary extension services and credit facility. These findings bear important policy implications for promotion of environmentally and economically sound land use in Chittagong Hill Tracts.

In land management related institutions the role of informal village level institutions comes out sharply. It is quite strong in terms of the management of the common land but also in interacting with the national land policies. Probably that underscores the need to consult and assimilate the experience the experience of the local level institutions in the construct of the national level policies. In the land management sector, due to the involvement of the private and common ownership patterns, it is necessary to evolve or think of a mix that blends the formal and informal institutions.

Economic Institutions

The economic institutions are induced and sustained with the help of economic parameters such as price, market, exchange and monetary interlocked interests. These institutions borrow the combination of the formal and informal institutions, and are stable on the ground until the economic interests sustain. Introduction of markets as the driving force of growth in the developing countries can be categorised as one of the major institutional departures. This assumes importance in the context of the meager marketing infrastructure developed in these countries and the existing imperfections due to the proverbial conduit called 'middleman'. The paper by Thijs Wissink on the impact of trade liberalisation on agriculture in Bhutan touches the chord of this change in the infrastructural regime. Bhutan is in the process of accession to the WTO and also takes part in the SAFTA (South Asian Free Trade Agreement). Bhutan is one of the strong institutional economies in the world and liberalisation has implications for its agriculture, both in terms of production as well as in terms of the marketing of its products. Generally, the productivity in Bhutan is relatively low compared to its neighbouring countries and that brings up the question whether its agriculture will be able to compete with the cheaper imports, which generally come along with trade liberalisation. However, further trade liberalisation is not likely to effect Bhutanese agriculture substantively, as its agricultural markets has been practically liberalised since 1949, when the country signed a free trade agreement with its big neighbour India. Bhutan started opening up to outside world from nineteen sixties, when it became a member of the UN and when the first roads were built. The fact that Bhutanese agriculture has its current low productivity level, is partly a consequence of the absence of adequate protection of its agricultural markets. Other factors are the unfavourable natural environment, its poor production and marketing infrastructure and the slow pace of modernisation by farmers. Finally it should identify new potential export products, for export to neighbouring countries, as well as Western countries. These products should be high value niche products. The country has comparative advantages for these kinds of products, lying in its exceptional environmental circumstances and the relatively clean production (low use of agrochemicals). Niche products to be identified could lie in the range of medicinal plants, organically produced products, floricultural products, incense and mushrooms. To make a success out of these products, very professional efforts should be made, again both in terms of production and marketing.

The rubber small holders of Kerala, a south Indian state also face a situation in the context of the process of world market assimilation. Balz Strasser looks in to the issue of changing market conditions for the Rubber small-holders of Kerala. In recent years, the Indian natural rubber sector has been affected by trends towards trade liberalisation, a reduced role of the state, and organisational reforms. Rubber small-holders in Kerala have been affected by these processes in different ways. It is hypothesised that small producers, especially the ones located in agro-ecologically marginal rubber areas, are nowadays coping these changes with attempts to move from rubber-dominated to more diversified livelihood strategies. Using empirical case study material, a detailed analysis of recent changes of livelihood strategies of different categories of small-holders will be presented. A special focus will be given to the analysis of the wider institutional setting within which small-holders operate, e.g. markets, trade unions, extension services, etc., trying to assess its supportive or hindering role in the diversification process.

There are attempts to meet the situation arising out of the changing institutional structure under the pressure of the forces of liberalisation and the market led growth initiatives. Some of these have to be essentially in the crucial sectors like market and credit. The paper by Deepak Shah on rural credit system in Maharashtra (a central Indian State) attempts a thorough analysis of the rural credit system and comes out with a few suggestions towards rejuvenating it. An investigation into rural credit delivery system in Maharashtra shows slower growth in institutional finances through commercial banks, credit cooperatives, RRBs and LDBs, particularly during the decade of 1991-2000, which is mainly due to adverse environment created by the financial sector reforms. High transaction costs and poor repayment performance are the twin root causes of the moribund state of rural credit delivery system. With a view to revive the agricultural credit delivery system, there is need to adopt innovative approaches like linking of Self-Help Groups (SHGs) and Non-Government Organizations (NGOs) with mainstream financial institutions. One of the recent studies conducted in Maharashtra has shown cent per cent recovery of loans through SHGs despite having excessively high rates of interest (24-36 per cent per annum) on their loan advances. In order to rejuvenate rural credit delivery system, the twin problems facing the system, viz., high transaction costs and poor repayment performance, need to be tackled with more fiscal jurisprudence reserving exemplary punishment for willful defaults, especially by large farmers. In fact, insofar as the rural credit delivery system is concerned, the focus should be on strategies that are required for tackling issues such as sustainability and viability, operational efficiency, recovery performance, small farmer coverage and balanced sectoral development.

Another alternative coming forth is the re-energising the future markets. The future trading existed in south Asia especially for a few commercial crops and cotton was important among these. The paper by Jatinder Bir Singh deals with futures markets and price stabilization in the Indian Hessian Market. Futures markets play important role in determining the inventory decisions in the cash market. These act as the nerve centre for collection and dissemination of information about the agent's expectations of future cash market. This paper demonstrates how the hessian futures market has led to reduction in cash market volatility in the hessian market. Figlewisky measure of volatility has been computed to take an account of inter-seasonal price variability. The evidence in this paper suggests that cash market volatility was less pronounced after 1992 when hessian futures market was established. The major role for futures market appears to be in reducing inter-seasonal volatility as opposed to intra-seasonal volatility. The results suggest that futures market may be indeed viable policy alternative for policy-makers to reduce uncertainty in agricultural markets. The liberalization of state support policy which was designed to stabilize farmers' income will increase risk and uncertainty

to market participants, whereas, the futures markets through its information role may vastly improve the storage across the seasons, thereby stabilizing cash prices.

Technological Interventions and Institutions

Depending on particular situations, institutions can act as conduit as well as barriers to technology. These can be barriers if the normative framework rejects the basic tenets of technology but at times the dissemination of technology is undertaken with the help of institutions. We had three papers dealing with the institutions disseminating or inhibiting the spread of technology. Steen Folke, analysed the present Training and Visit Extension institutions to suggest that these could be replaced or complimented by Farm Women Groups. Agricultural extension in India has been dominated by the Training and Visit approach initially propagated by the World Bank. The approach has been criticised for its rather top-down communication, individual focus on contact farmers and narrow and standardised extension messages. From the mid-1990s more broad-based, group-focused and participatory approaches to agricultural extension have gradually replaced the T&V system. This evolution is also reflected in the history of four Danida-supported training projects for farm women, three of which were initiated in the 1980s. The projects are Women and Youth Training and Extension Project, WYTEP, in Karnataka (1982-2005), Tamil Nadu Women in Agriculture, TANWA (1986-2003), Training and Extension for Women in Agriculture, TEWA, in Orissa (1987-2003) and Madhya Pradesh Women in Agriculture, MAPWA (1993-2005). These projects have been innovative in so far as they have for the first time on a major scale targeted women in their role as agricultural producers. The impact is analysed in relation to the institutions involved, particularly T&V versus the Farm Women Groups, and the village-based training employed by three of the projects versus training in district agricultural centres employed by the oldest and biggest project, WYTEP.

The recent introductions of Gene revolution and GMO varieties have created differential responses of the society. The responses range from total rejection to the acceptance of these newly introduced technologies. Kumbamu Ashok, wrote about the "Gene Revolution" in the Era of Globalization taking a case study of Agra. In the early 1960s, the "Green Revolution" package comprising the "miracle seeds", controlled irrigation, fertilizers, pesticides, and correlated farm management skills has been introduced into the post-colonial societies with the premise of averting the Malthusian spectre of famine. The past experiences in Indian agriculture also show that the potentials of the technological application could not be realized due to lack of proper instructional support. Indeed, agrarian institutions have very important role to play in the era of the "Gene Revolution" since (a) the new technologies are knowledge/information-intensive and the cost of imperfect information in terms of yield or production loss is very high; (b) the new seeds increase pressure on cash-needs of the peasantry; and (c) inadequate vigilant regulatory mechanism to control selling of spurious seeds may devastate entire crops, which may result in negative externalities and collective actions. The proponents of biotechnology often claim that the "Gene Revolution" is a prolongation of the "Green Revolution" or the "Doubly Green Revolution" or the "Evergreen Revolution", and the new technology is "neutral" and the benefits could be more widespread to all regions. They further argue that to realize the potentiality of the new agricultural technologies of the "Gene Revolution", efficient agrarian institutions would be required. Contrary to the enthusiastic claims of the proponents, the opponents of the "Gene Revolution", by considering the "terminator" and "gene-pesticide" character of the new seeds, argue that biotechnology has profound implications for millions of poor farmers and environment in the Third World, whether or not there is proper institutional support. However, the institutional division between "basic research" (public research) and "applied research" (private research), overwhelming involvement of private sector in research,

development and marketing of the new seeds, extension of patents to living organisms (genes in particular) under the new trade regime, commoditization of seeds, rapid adoption of genetically modified crops by farmers across the globe and possible adverse consequences of biotechnology have become the central issues in the raging global debate about biotechnology. However, biotechnology is an innovative technology, which offers many possibilities for development and application. The consequences - opportunities and risks - involved are remain uncertain. The central problem is therefore the uncertainty of knowledge. This uncertainty also applies to the question of whether biotechnology conforms to the overall concept of sustainable development. Therefore understanding the potential benefits and risks of biotechnology going beyond the narrow economic cost/benefit analysis and gauging its relevance to rural development in India is very essential. However, the contemporary issues pertaining to agricultural biotechnology can be adequately understood only when viewed in a socio-historical perspective. Thus the paper attempts to analyze the political and economic history of development of biotechnology and the importance of agrarian institutions in the era of globalization and biotechnology. In so doing, the paper is structured as follows: (i) conceptual and theoretical aspects of the development of the new agricultural technologies in general, and biotechnology in particular; (ii) transition from the "Green Revolution" to the "Gene Revolution" and its implication for agrarian change in India; (iii) the implications of institutional reforms in the milieu of liberalization and the "Gene Revolution" for the Indian peasantry, research and development and domestic seed industry; and (iv) finally, it addresses the need of the new agrarian institutions in the ear of capitalist globalization and biotechnology.

Another way of looking at the introduction of the Genetically Modified (GMO) Crops in Indian Agriculture comes out of the proposal put forth by M N Panini. It is not a paper in the sense of providing answers to some of the intricate questions, but it is aq challenge in terms of what a researcher should look into while addressing to the question of GM seeds. Specifically, the controversy about the introduction of the GMOs has been keeping the debate alive. While there are reports of farmers in Gujarat already cultivating Bt cotton extensively, formal approvals for the commercial sale of genetically modified seeds of Bt cotton and of potatoes have not been granted as yet. The Bt cotton crop has been developed by one of world's major agribusiness firms Monsanto in collaboration with the Indian firm Mahyco whereas genetically modified potato has been developed by an Indian scientist. It is claimed that transgenic crops increase productivity and reduce ecological stress; farmers will not have to use pesticides and fertilizers thereby increasing productivity. This development is not even a decade old found in the genes of species of d in plants from issue of introduction of genetically modified organisms (GMOs) in Indian agriculture has now become a major controversy. The controversy has been stirred by several NGOs who have vehemently opposed the introduction of GMOs. Biotechnology promises self sufficiency for developing countries despite prospective population increases and minimises ecological stresses. Vigorous opposition to biotechnology—food developed by biotechnology is referred to as Frankenstein food. The international patent regime, the big biotechnology corporations, government regulations on the transgenic varieties, NGOs and the WTO agreements intermesh to determine whether the potentials of biotechnology are realised. This study attempts to examine the working of the regulatory institutions in Bt cotton. It also looks into the methodology of extension of the new technology and to study how it affects the attitude of the farmers towards the new technology. Apart from these how have the campaigns against Bt cotton affected the farmers? Do they resist the technology? Who are the farmers who have agreed to cultivate Bt cotton on their fields? Are there any farmers who are opposing Bt cotton? What are their grounds for opposing Bt cotton?, are some of the questions of interest need to be addressed.

Socio-Political Institutions

Not many studies have addressed to socio-political institutions. In their paper Deshpande, Hatti and Jyotishi, address to explain the poverty scenario in India with the help of institutional approach. Basically their argument begins with a long-term view of poverty, tracing the political economy of the poverty alleviation programme. The paper highlights the role of political and social institutions in perpetuating poverty. It also brings out clearly the role of land and labour institutions in poverty scenario in India. One of the major institutional steps taken in India during nineties is the decentralization of administration with the help of Panchayati Raj institutions. It is expected that these institutions will help in planning and implementation of the developmental initiatives, provided the promise of the constitution is adhered to. The development of the rural poor is an essential issue for the country's equitable and sustainable economic development. The experience so far, has been that the economic development of the weaker sections was not possible through the government intervention alone. Other alternatives are: actively involving people to form co-operatives and the involvement of Non-Government Organisations, banks, educational institutions, panchayat raj institutions, etc. In this paper, an effort has been made to analyse the role of farmers' cooperative society in the form of a group called Sericulture Quality Clubs (SQCs) in the rural development in general and the sericulture activity in particular.

Given the span of the papers certain issues emerge for discussion.

- What is the role of Institutions in agricultural as well as in overall development scenario?
- It is necessary to deliberate on the forms and operations of social-political and economic institutions in various sectors.
- A comparison between the traditional and new emerging institutions with an emphasis on their impact on the economy and society, needs to be analysed.
- Inter-linkages of social-political and economic institutions and their impact on the aggregate growth.
- What are the roles of formal and non-formal institutions and their mutual interface, in the context of developing society?

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