
Application of Organic Farming Technology Improvises Green Growth by Enhancing Rural Livelihood and Sustainable Development

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Abstract:

The organic agro-biotech for green growth and sustainable development study is aimed to develop a conceptual framework that captures the relevant dimensions of livelihoods and adoption of innovation for the analysis of green growth and sustainable development. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved. Organic production is both old and new in the India. Organic farming is emerging as a sustainable alternative in reviving green growth especially in areas where the indiscriminate usage of chemical fertilizers and pesticides had resulted in loss in soil fertility and productivity with adverse effects on water quality, soil, plant and human health. Organic agriculture is one of ecological agriculture models with the specific definition and strict standards, which is an important aspect of sustainable agriculture. Study complemented the widely accepted sustainable livelihoods framework with the organic agro-biotech that allow addressing economic and non-economic aspects of rural households and the process of developing nature friendly livelihood strategies.

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Key words: Organic Farmers Interest Groups (OFIGS), Livelihood Security, Green Growth, Food Security, Sustainable Development.

Introduction:

Organic agriculture is a holistic production and management system which is supportive to environment, health and sustainability. Of the world's 1.09 billion extremely poor people, about 74 % or 810 million live in marginal areas and rely on small-scale agriculture for their livelihood. India is mainly an agricultural country, where agriculture contributes to about 14.6 percent in gross domestic product (GDP) and support over 58 percent of nation's population for livelihood (GOI, 2010). Promoting the organic agriculture is of paramount importance to protect biodiversity and cultural diversity of India. In most developing countries, agriculture continues to be the most important sector of the economy, accounting for the biggest proportion of employment (Båge, 2005). Organic farms although yield on an average 10-15% less than conventional farms, the lower yields are balanced by lower input costs and higher margins. Its annual growth rate has been about 20% for the last decade (Lotter, 2003), accounting for over 31 million hectares of area and generating over 26 billion US dollars in annual trade worldwide (Escobar and Hue, 2007). Organic agriculture is now being practiced in more than 130 countries with a total area of 30.4 million hectare, about 0.65% of total agricultural land of the world (Willer et al., 2008). With respect to the area under organic agriculture, Australia occupies the prime position followed by China, Argentina, USA, Italy and many other countries (Willer et al., 2008). India, although comes at second place with respect to total number of certified organic farms (44,926), occupies 13 position as far as the area under organic agriculture concerns. In India, about 528,171 hectare area is under organic agriculture (including certified

and area under organic conversion) accounting for about 0.3% of total agricultural land. According to the International Federation of Organic Agriculture Movement (Willer et al., 2008) the major objectives of organic farming include:

1. Production of high quality food in sufficient quantity in harmony with natural systems and cycles,
2. Enhancing biological cycles within the farming system involving microorganisms, soil flora and fauna, plants and animals,
3. Maintaining long-term soil fertility and genetic diversity of the production system and its surroundings including plant and wildlife,
4. Promoting healthy use with proper care of water resources and all life therein,
5. Creating harmonious balance between crop production and animal husbandry,
6. Minimizing all forms of pollution.

As such, unless effective strategies for agriculture development are successfully implemented, ending rural poverty will remain a distant goal. Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions rather than the use of inputs with adverse effects. Although organic agriculture is certainly growing in popularity, there are conflicting opinions about its potential and the benefits it can offer, in particular whether organic methods can actually improve the livelihoods of smaller farmers. Similarly, questions remain about what impact organic methods have on labor, soil quality, local economies, and risk. Two areas of debate are most prominent: the local risk-benefit ratio of organic adoption and the marketability of smallholder organic products. Organic agriculture is a production system based on an agro-ecosystem management approach that utilizes both traditional and scientific knowledge.

Methodology:

The study is designed on the farming system comparison study in which 60 organic and 60 conventional farms were monitored over a period of two cropping seasons and study of group organic farming practices. Respective analysis & descriptions with a range of qualitative studies, structured survey, available secondary & generated primary data and information's with the designed parameters are duly carried out. In this comprehensive study, analysis of opportunities, constraints decision-making processes and obstacles in the adoption of organic farming were also tried out as co-supplements.

Area of Study:

Under the study, in different agro-climatic conditions seven states across the India are selected in table-1.

Table-1: Geographic coverage and crops selected for study

State	Sample districts	Crops
Chhattisgarh	1.Sarguja	Paddy
	2.Korea	Black Gram
	3.Bastar	Pearl Millet
Gujarat	4. Anand	Ragi
Himachal Pradesh	5.Shimla	Cabbage
Madhya Pradesh	6.Bhopal	Soybean
	7.Chhatarpur	Medicinal & Aromatic Plants
	8. Sagar	Wheat
	9.Sidhi	Pulses.
Rajasthan	10.Jaisalmer	Yellow & Black Mustard
Uttaranchal	11.Dehradun	Paddy
	12.Udham Singh Nagar	Sugar cane
Uttar Pradesh	13.Lucknow	Banana
	14.Jaunpur	Potato

Random sample of fifteen organic clusters and fifteen inorganic clusters were interviewed regarding their cost of cultivation in major crops grown by them from each of the three districts. The

data for both input and output quantities and their unit prices were collected from sample farmers. The study pertains to the cropping year 2009-12. From Chhattisgarh state three districts are selected as illustrated in the table-2, for the comprehensive study. The details of study coverage and crops identified across different states are presented in table-2.

Table-2: Different Organic Farmers Interest Groups in Chhattisgarh

Group No	Area I		Area II		Area III	
	Number of Organic Growers	Total Organic Cultivation area	Number of Organic Growers	Total Organic Cultivation area	Number of Organic Growers	Total Organic Cultivation area
1	20	33.184	20	30.356	20	36.15
2	20	43.53	20	9.570	20	35.44
3	20	35.646	20	31.200	20	40.655
4	20	28.950	20	41.890	20	42.705
5	20	22.370	20	16.606	20	42.845
6	20	54.160	20	32.630	20	48.040
7	20	84.062	20	34.100	20	41.000
8	20	43.900	20	50.545	20	43.320
9	20	23.200	20	46.543	20	38.870
10	20	54.429	20	42.640	20	52.000
11	20	38.986	20	32.430	20	46.050
12	20	54.407	20	38.529	20	58.000
13	20	40.558	20	42.950	-	-
14	20	23.548	20	30.490	-	-
15	20	18.800	20	31.330	-	-
	300	599.73	300	481.453	240	525.075

The essential data collected from secondary sources as well from primary sources are analyzed. The methodology for the study is based on farming system approach. The present study is an innovative effort for dovetailing two separate concepts. Under the first concept livelihood security & green growth

studied provided by organic farming various farming systems across seven (7) states of India is attempted to study identified ensuring wide agro ecological coverage. Areas of Hill Food Crops, Rain fed Cash Crops, Rain fed Food Crops, Soybean Farming, Plantation Crops, Irrigated Mixed Farming, Medicinal & Aromatic Plants Farming and Vegetable Farming, are selected for the research study. These selected farming systems spread over seven (7) states of viz. Himachal Pradesh, Uttaranchal, Rajasthan, Madhya Pradesh, Chhattisgarh, Gujarat and Uttar Pradesh across India. Under the study 14 crops are investigated viz. 1. Banana, 2.Sugar cane, 3.Potato, 4.Paddy, 5.Soybean, 6.Pearl Millet, 7.Yellow & Black Mustard, 8.Medicinal & Aromatic Plants, 9.Wheat 10.Cabbage, 11.Ragi, 12, Barley 13.Black Gram and 14.Pulses. The 14 villages are selected in such a manner that these fairly represented different farming systems. Finally, samples of farmers are randomly selected for comparative study of organic farmer's vs. inorganic farming techniques. The data & information's are collected through personal interviews and a structured questionnaire are used for gathering information. In the second study, role and importance of organic agro-biotech farming in sustainable livelihood development analysis in three district viz., Sarguja, Korea and Bastar of Chhattisgarh region is carried out.

Table-3: Bastar, Sarguja & Korea community farmers 2011

Income source	Average monthly household income (Rs)	Contribution of income sources to total household income expressed as %
1.Wages	716.09	52.0
2.Social grants	714.56	28.9
3.Home organic gardens	123.53	6.0
4.Small-scale household commercial enterprises	72.55	2.2
5.Organic community	69.46	8.0

farming		
6. Remittances	50.00	2.9
Total	1746.19	100

In these three organic farming clusters five capital assets (physical, human, financial, social and natural) are assessed using primary and secondary data. Primary data was collected by adopting rapid and the participatory methods using appropriate analysis tools (DFID 2000). During data collection for present study every key indicator of different capital assets was evaluated at cluster/village level of 1500 hectare organic farming with the participation of the community and is evaluate on fixed marked methods according to their importance. The rapid methods referring to primary data, rapid case studies, key informants interviews and focused group discussion etc. while participatory methods used in an extractive mode of in-depth studies. In the process Stage I of rapid methods the secondary data related to different kinds of capital assets was collected from different departments of Government agencies working on poverty alleviation, village panchyat, other NGOs and development societies etc. In the *Stage II* of participatory approach sample households in the village participate in focus group discussions. The key issues of discussion were the status of the five capitals and employment activities in the village. These exercises are continued for three to four days in each of the selected villages and different activities like collective mapping of the local area, developing a time line, ranking the importance of problems inside a matrix, wealth ranking, doing observation walks, producing seasonality calendar etc. The process of participatory rural appraisal (PRA) and matrix ranking are successful applied together for the information within limited time. Further the group gathering was stratified in to different categories on the basis of gender and land holding to assess the information about vulnerability context relating to poorest of the poor farmers in the village.

Various key indicators are used to access the different kinds of capital assets and these indicators are ranked into very good, good, moderate, poor and severe based on the availability and accessibility by the farmers in each of the village /cluster of the three districts. The key indicators again scored on fixed mark i.e., 45 for very good, 30 for good, 15 for moderate, 08 for poor and 02 for severe. Most of the indicators are evaluated in the ascending order of changes from lower to higher values but few are in descending order. For instance if water table increased substantially then it ranked very good and scored with 45 marks but if migration was higher than it ranked very poor and scored only 2 marks. Care was taken to involve both male and female member in eliciting the information. The simple method of percentage is used to access the present status of livelihoods capital assets in all the three clusters. In terms of measurement the total scored value of each indicator was averaged to avoid any complexities of double scoring because of higher or lesser number of indicators in different capital assets. And the percentages of average value of each indicator to total average value of all indicators are calculated. The value in percentage of each capital asset depicts the present status of livelihoods capital in the form of pentagon in all the three clusters. In each cluster the source of livelihoods focused mainly on seven core activities i.e., organic farming, labor wages in organic farming and non-agriculture activities, selling of non-timber forest organic produce, organic nursery of plants, bio-produce trading, livestock and other profession (extracting oil from *bio* seeds, compost, bio-culture, plant protection etc). The data is derived from on-farm and off-farm activities based on the village level study. The concept of rural income generating activities and different kinds of dependencies are elaborated broadly to the farmers before commencing the study of different kinds of livelihoods sources of the villagers in each village. The farmers including men and women are asked directly and indirectly their sources of income from different activities in particular

months of a year. Impact is recorded and measured based on the information collected from the sample households and their mutual observations on different indicators of particular capital assets. Accordingly the indicators are categorized under different capital assets such as financial, physical, natural, social and human capital. To examine the status of working days for male and female farmers in the villages, a seasonal calendar activity was prepared for 2009-10. Initially the working hours from early morning 5.00 o'clock to late night up to 9.00 o'clock of male and female farmers are divided into different activities i.e., organic farming related work, domestic work, livestock and poultry farm, non-timber organic forest produce, non-organic farming labor wages and any other business or profession. The male and female farmers of sample households are asked separately about how much time they are spending on particular activity during a day. Obviously, except routine work the working hours of male and female for different activities varied from season to season and even from month to month. Further these hours are converted into days assuming 8 hours as working hours in a day. Following the above process seasonal calendar activities are prepared, which depicts per households person days of working on specific items in particular months table-4. This study draws upon yearlong field research in Bastar, Sarguja & Korea community of small family farmers in the state of in Chhattisgarh.

Table-4: Total household income in Bastar, Sarguja & Korea 2011.

Income source (small-scale commercial enterprises)	Average annual income (Rs)	Contribution of small-scale commercial enterprises as percent (%) of total annual household income
Service	326.56	37.51
Making furniture & handcrafts	248.53	28.55
Selling of traditional medicine	116.96	13.43
Selling firewood	60.93	7.00

Organic commodity	60.50	6.99
Building and repairing houses	54.41	6.25
Domestic working	31.34	3.60
Sewing	13.24	1.52
Hawking	11.32	1.30
Catering	2.94	0.34
Other/not specified	4.41	0.50
Total	870.64	100

More specifically, it focuses on socio-ecological implications of organic agriculture for local livelihood strategies. Data were collected using a variety of methods. These included participant observation, open-ended interviews, archival research and surveys (both quantitative and qualitative). The sustainable rural livelihoods framework (Scoones, 1998) is the approach used in our analysis.

Results:

1. Organic farming and Green Growth

Organic farming is emerging as a sustainable alternative in reviving green growth especially in areas where the indiscriminate usage of chemical fertilizers and pesticides had resulted in loss in soil fertility and productivity with adverse effects on water quality, soil, plant and human health. It contribution to improved profitability and therefore income, due to premium price and lower cost of production, is widely documented. Organic agro-biotechnology contribution to environmental sustainability is now a generally known fact and has been the main basis for subsidies program to support green growth & sustainable development. It is also generally accepted that improved employment opportunities in rural areas through organic agro-biotech could provide rural youths with jobs, reducing rural-urban migration and alleviating population pressures in urban slums.

Table-5: Green Growth: Household typologies among organic producers.

Particulars/ Criteria	Household typologies		
	Type-1 Family farm	Type-2 Mixed household	Type-3 Instrumental retreat
Education	Primary	Primary/Secondary	College/Graduate
Labor	Family	Family/Hired	Hired
Self-consumption	High	Low	Not Relevant
Services	Poor	Standard	Depending on use
Off-farm work	Agriculture (if any)	Local Services	Professionals/entrepreneurs
Residency	Farm	Town	Town/City
Participation	Low	Medium	High
Off-farm income	Sporadic	regular	Always
Organization	Nuclear	Nuclear/individuals	individuals
Tourism	Not Common	Most of them	Private/informal

Organic agro-biotech's contribution to health improvements due to reduced exposure to pesticides is also widely recognized and very well documented. While some producers devote significant portions of the farm to timber (eucalyptus and/or sal trees etc.) others do not manage this resource. Despite this variability, farmers across municipalities do share two common land use trends: agro-ecological diversification and preservation of areas with native forest. Besides differences in size and land use, local organic producers are diverse in terms of their livelihood strategies. Table-5 shows three basic typologies of organic producers found in the study area.

The main differences across these different types of organic 'practices' are the relevance of agro-ecological income in the household, and their position in the socio-economic network of organic activists, business communities, consumers and farmers. Their soil is rich in organic humus & biomass that provides extra carbon mitigation potential. (Agro-ecological income can be defined as benefits flowing from practicing organic methods, for instance in terms of extra wildlife to

harvest or extra output resulting from conservation biological control where a bio-diverse non-sprayed farm eventually provide habitat and food sources to beneficial, which help control pests).

Family farmers (Type-1) rely extensively on the agro-ecological resources of the farm for productive and reproductive functions, and they have lower levels of economic and social capital—less income and less education, less influential connections and less access to information. Family farms are located outside the ‘downtown’ of the village often in places of difficult access, i.e. hilly terrain, dirt roads and limited communications.

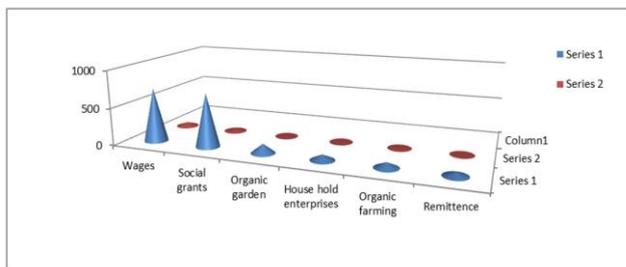
In contrast, most mixed households (Type-2) work with tourism and hire labor to plant, weed, harvest, and process). In mixed households, at least one adult work off-farm in local jobs as teachers or civil employees. Joining organic production does not prevent such households from establishing residency in the local *area/region*, which in practical terms means direct access to local services (phone, bus, stores, school, bank, pharmacy, etc) and networks (associations, gatherings, etc). A third category (Type-3) of organic households, which we refer to as “instrumental retreats”, corresponds to households which do not obtain significant agro- ecological income from organic production, but rather they use the ‘farm’ for personal, recreational, community service, and/or political articulation in the community. This category comprises professionals residing outside, including absentee owners, who sympathize with the local association for organic farming. These ‘instrumental retreats’, which are also organic and part of the local association for organic farming, are partially productive. Some have fruit trees, or chicken, or hives. However, this category of organic agriculture may be better understood as spaces of social exchange. Meetings, assemblies, workshops, and symposia are articulated by these organic ‘producers’, who contribute with

their knowledge and connections to the advancement of organic farming in the region.

2. Organic Farming and Rural Livelihood

Organic farming & organic products are the outcome of professionals and entrepreneurs in different areas. Findings showed that organic farm and non-farm livelihood activities were critical components of rural livelihoods community of small family farmers in the state of in Chhattisgarh.(OFIG) operates in the areas different areas commercializing a variety of foods (milk, honey, sugar, vegetables, rice, etc). After organic adoption their organic production will be “properly” certified organic - and Bastar’s agri-tourism program keeps expanding. Column graph fig-1. shows the Average monthly household income (Rs) ratio vs. contribution of income sources to total household income expressed as percentage.

Fig-1: Column graph monthly household income vs. contribution of income sources to total household



The organic productive units analyzed have different agro-ecological patterns and farms sizes (figure-1). Farm size ranges from less than a hectare (farmers producing honey ‘renting’ the use of a forest area for their hives) to farms over 40 hectares (up to 50). Most of these are connected to a local agro industry (sugar, jellies, canned foods, cheese). In addition to size, land use patterns also vary significantly among farmers. Organic

community gardening contributed less to total monthly household income (6 % of total monthly household income) than wages (39%), social grants (41.9 %), organic home gardens (8%), small-scale enterprises (2.2%) and remittances (2.9%).

Even though low, the contribution of organic farming to food security cannot be ignored considering the number of households that depend upon organic agriculture for food and income. Strategies to promote more productive organic farm and non-farm activities are needed to improve rural livelihoods. In table-2 , sources of income and their contribution to total monthly household income among the community farmers and Organic Farmers Interest Group (OFIG) are analyzed. The household survey, conducted in 2011, shows that wages received were the greatest contributor to household income. Fifty Two percent (52%) of total household income was generated from wages.

This finding presents a strong case for the school of thought that recognizes the contribution of agriculture, but attaches more importance to non-agricultural activities (Anderson M.D., 1994). Social grants were the second most important source of household income with a contribution of 28.9% to total household income followed by organic community farming (8.0%). The fourth contributor to household income was by organic home gardening contributing 6% and small-scale household economic enterprises (4.2%). In total, organic community and home gardens contributed 14% to total monthly household income. Even though low, the contribution of organic farming to food security and sovereignty cannot be ignored, considering the large number of rural households dependent on it. The study clearly suggests that non-farm income sources as a category contributed more to household income than organic farming among the participating households. Eighty six percent of total household income was from non-farm sources. Table-4 Sources of income from small-scale commercial enterprises and

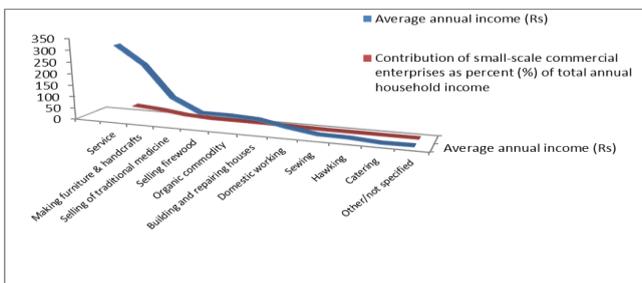
contribution to total household income in Bastar, Sarguja & Korea, 2010.

Specifying small-scale economic enterprises and analyzing the contribution of the various sources of income to total household income within the same category provided interesting results as illustrated in Table-3. Overall, Table-4 indicates that small-scale commercial enterprises contributed on average Rs. 870.64 annually. These results suggest that households in the Bastar, Sarguja & Korea uplands diversified their sources of income and/or livelihood activities to supplement organic agriculture-based livelihoods. This finding is substantiated by other studies that concluded that typical livelihood strategies in rural areas comprise diverse income sources. This means that while organic agriculture (potentially) plays a role in rural livelihoods, livelihood insecurity cannot be solved by promoting organic agricultural growth alone.

3. Poverty reduction

Organic agriculture for poverty reduction was pioneered by farmers themselves and was advocated by NGOs, who worked closely with poor farmers. More recently, governments and donors have taken note of organic agriculture’s potential as a development strategy, due mainly to the locally available, low input-cost and high demand for safe food and potential price premiums for organic products.

Fig-2: Organic Farmers Enterprises vs. Income sources



4. Organic products and production costs

Employing organic farming methods will lead to higher profits for farmers not only because of price premiums, but also because of lower production costs (Rosegrant, et al., 2005). Organic-agro biotech technologies can lower the costs of production as chemical inputs are substituted by locally available and cheaper organic inputs and more intensive labor which the poor often have in abundance. Adoption of systems also lowers the need for credit, which is often expensive and difficult to obtain for small farmers.

5. Organic and production risks

Study show that organic-agro biotech can lessen the risk of income losses associated with seasonal variations or crop failures. On the one hand, diversification, which is common in organic systems, has been shown to increase farm production by 20 to 60 percent as compared to a traditional low-input system (FAO, 2003). This diversity, in conjunction with greater on and off-farm biodiversity, allows farmers to derive extra income from the sale of additional products or wild crops and non-timber forest products (Rundgren, 2002).

Some organic systems also favor the use of traditional varieties which are typically more resistant to local pests and diseases that minimizes production risk. since it allows farmers to save their own seeds, farmers can gradually increase crop resistance to pests and diseases by breeding these seeds for "horizontal resistance" (Scialabba, et al., undated). Anecdotal evidence also suggests that organic systems are more resistant against droughts and typhoons mainly because organic matter increases the soil's ability to take in water during rainfall events (Sullivan, 2002).

6. Organic farming and profitability

There is substantial evidence linking organic- with improvements in the profitability and income of poor farmers

Case studies by UNESCAP (2002) also shows that certain organic farmers' groups were able to double their income due to the lower cost of organic inputs and lower credit costs. More importantly, studies show that organic agro-biotech has been particularly profitable for small holders.

Study in Latin America and the Caribbean (2003) reveals that organic-agro biotech has benefited smallholders the most. A more recent study by Setboonsarng, et al., (2005) on organic rice contract farming likewise finds that small organic farms are more profitable and efficient than larger farms, and that in general, organic rice contract farming is more profitable than conventional non-contract farming by a significant margin for all scales of operation, even when the non-cash costs are included. Similar promising trends are reported in numerous studies by other researchers (Mac Rae, et al., 2004; Lohr, 2002; Rundgren, 2002).

7. Organic and food security

Findings from references & literature suggest that organic farming can lead to improved food security at the household & community level. Pretty(2002) cites the results of a study by the University of Sussex which revealed that organic farming resulted in improvements in nutritional & rich food production by smallholder farmers through one or more of the mechanisms. Organic farms although yield on an average 10-15% less than conventional farms, the lower yields are balanced by lower input costs and higher margins. Its annual growth rate has been about 20% for the last decade (Lotter, 2003).

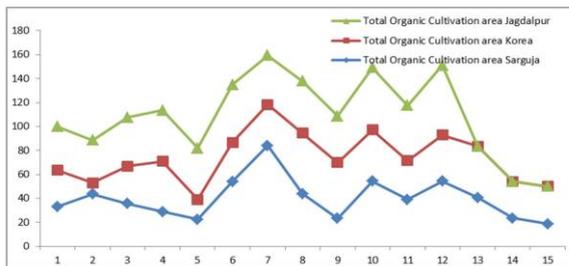
8. Organic farming and sustainable development

With the OF practices OFIGs are farming in the community, strengthening local association. Organic Farmers Interest Group (OFIG) associations since 2011, are active to promote the quality of life of small family through organic agriculture. That Increases diversity, long term soil fertility, high food quality,

reduced pest/disease, self-reliant production system, stable production.

Reduced pollution, reduced dependence on non-renewable resources, negligible soil erosion, resilient agro-ecosystem, compatibility of production with environmental benefits are major gains. Improved health, better education, stronger community, reduced rural migration, gender equality, increased employment; good quality work strengthens the social groups. Cohesiveness, stability, democratic organizations, enhanced capacity are the indicators of sustainability with organic farming.

Fig-3: OFIGs and their organic land holding size (Area1- Sarguja, Area2- Korea, Area-3 Jagdalpur).



Discussion:

In India, organic agriculture is viewed as a two-dimensional opportunity: first, for developing organic agribusiness, by focusing on organic production. Second, organic is also seen as an important livelihood option for small, resource-poor farmers with low-input costs and quality food production. Organic agriculture also holds last hope to the farmers. There are two types of organic farmers. The large estate owners are contract farmers associated with the corporate sector, doing organic farming as agribusiness opportunity. And then there are those with small landholdings of rain-fed marginal farmlands,

looking for options that would reduce their dependence on external inputs, reduce cost of cultivation, and provide food and income security using on-farm resources and family labor. The small farmers own one or two animals but have no access to credit, irrigation facilities, and adequate quantity of biomass and composting.

The only resources available for organic farming are cow dung and urine, biomass from a few trees, and 60% land area marked for growing crops for self-consumption, etc. The organic movement, which was started by women's groups, NGOs, and farmers in the 70's and 80's, is increasingly receiving worldwide attention from the private sector, governments, and international organizations. Not only are the prices of fertilizers and other regaining the earlier level within 2-5 years. There is also a class of farmers who cultivate food crops and vegetables organically for self-consumption and use all sorts of chemical inputs on rest of the farm to produce for the market.

Local homogenous groups & associations of Organic Farmers Interest Groups (OFIGs) for organic farming were established in the region, for different organic input production units. Organic producers can be identified in the community of Bastar, Sarguja and Korea regions family farms, mixed households, and instrumental retreats. These three types of 'producers' do not differ so much in terms of their agro ecological practices (diversification), but in relation to the role that the income resulting from organic production plays in the households. This in turn is deeply correlated to the capacity of the household to access social and economic capitals. Households depending almost exclusively on agricultural incomes do not fully participate in the decision-making process of the association(s) they belong to and have less educational resources – a characteristic shared chemical inputs escalating, the doses required for maintaining the production level are also increasing over time.. The study highlighted motivating

factors of food and income security for the farmers to adopt organic farming.

The factor most feared by the inorganic farmers is the initial decline in farm productivity while switching over to organic farming. More than 81 percent of the farmers reported this decline which was reported to be in the range of 10-47 percent in the first year, depending upon the farming system. The crop yields were reported to with non-organic small family farmers in the region such as tobacco producers. In contrast, organics have also fostered new typologies; the mixed household and the instrumental retreat. In mixed households, “organics” are an alternative extra source of income, and the tendency is to rely on services (tourism) rather than small-scale agro-industrialization. In instrumental retreats, unlike in the two previous types, organics are not that much of a productive, but a political tool. These institutional spaces serve to connect urban residents involved in OFIG to the local reality of the producers. At the same time, retreats open the rich socio-economic networks of the urban society to the rural community.

Conclusions:

This study presents some of the fundamental conceptual issues of organic farming and green growth, livelihood security sustainability. A random study reveals that organic farming practices supports green growth & is pro-poor and pro-women livelihood provider. It has strong merits and potential to increase income, alleviate poverty sustain natural resource management across different agro-climatic conditions and diverse farming communities.

Although, it reflects that the degree of the impacts would be stronger for some region and farming system than others. The organic agro-biotech contribution to improvements in income, food security and environmental sustainability the

linkages are fairly well-defined and there is sufficient empirical and anecdotal data to support these.

Most importantly, the extents of impacts would depend on the share of agriculture income in total household income. In nutshell the application of organic farming technology is improvising green growth by enhancing the rural livelihood and sustainability. As a matter of fact the organic movement is increasingly receiving worldwide attention from the farmers to private sector, governments, and international organizations.

REFERENCES:

1. Båge, Lennart 2005. Statement delivered on the Launch of the MDG Report - 18 January 2005.
2. GOI. (2010): Union budget and economic survey. <http://indiabudget.nic.in>. (Last accessed on September 2011).
3. Lotter, D. (2003): Organic Agriculture. *J. Sustain. Agric.*, 21, pp. 1-63.
4. Pretty, Jules, 2002. 'Lessons from Certified and Non-Certified Organic Projects in Developing Countries.' In *Organic Agriculture, Environment and Food Security*, edited by Nadia Scialabba and Caroline Hattam. Rome: Food and Agriculture Organization of the United Nations.
5. MacRae, Rod, R. Martin, et al. 2004. Does the Adoption of Organic Food and Farming Systems Solve Multiple Policy Objectives? A Review of the Existing Literature.
6. Lohr, Luanne, 2002. Benefits of U.S. Organic Agriculture. Available: http://www.wto.org/english/forums_e/ngo_e/ccc_organic_agric_e.
7. Rundgren, Gunnar, 2002. *Organic Agriculture and Food Security*. Bonn.

8. Setboonsarng, et al., (2005). 'Child Malnutrition as a Poverty Indicator: An Evaluation in the Context of Different Development Interventions in Indonesia.' ADBI Discussion Paper No.21, Tokyo: Asian Development Bank Institute.
9. 2003. The adoption of organic agriculture among small farmers in Latin America and the Caribbean: Thematic Evaluation. Rome: IFAD
10. UNESCAP. 2002. National Study: India. In Organic Agriculture and Rural Poverty Alleviation, Potential and Best Practices in Asia. Economic and Social Commission for Asia and the Pacific of the United Nations. (<http://www.unescap.org/rural/doc/OA/OA-Bgrd.htm>).
11. Sullivan, Preston, 2002. Drought Resistant Soil. Available:
<http://attra.ncat.org/atrapub/PDF/drought.pdf>.
12. Scialabba, N., C. Grandi, and C. Henatsch (undated). *Organic Agriculture and Genetic Resources for Food and Agriculture*. Available:<http://www.fao.org/documents/>
13. Rosegrant, Mark W., C. Ringler, et. al. 2005. Agriculture and Achieving the Millennium Development Goals. Washington: Agriculture and Rural Development Department, World Bank.
14. Anderson M.D (1994) "Economics of organic farming in USA" in The economics of organic farming – An international perspective (ed.) by Lampkin N.H and Padel S., CAB International Publishers.