

**Development of Agriculture**  
*in*  
**The Era of Climate Change**

**Volume - 2**

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## Sustain Agriculture for Livelihood Security

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*Sherly Kurien*

Development is a multi dimensional concept. Though in the earlier period development was confined to economic, social, cultural and technological areas, the thinking has undergone a sea – change, and now the development debate takes up a plethora of economic and non-economic issues. It is in this connection the concept of sustainable development makes a prominent mark. Sustainable development seeks to refocus attention on the ultimate objective of development, putting people first and at the centre of development process. A UNDP Report (1994:4) on the subject puts the concept in its proper perspective:

“Sustainable development is development that not only regenerates economic growth but distributes its benefits equitably; that regenerates the environment rather than destroying it; that empowers people rather than marginalizing them. It gives priority to the poor, enlarging their choices and opportunities and, providing their participation in decisions affecting them. It is development that is pro-poor, pro-nature, pro-jobs and pro-women and pro-children”.

Though development should be people centred, the effects do not percolate to one and all in the society. The earth which we have habituated, which was a beautiful planet is now a place of mass destruction and deprivation. The mankind is now faced with a very serious crisis of ecological imbalance and its consequential adverse effects, e.g. reflected in global warming, thinning of ozone layer, vast changes in climatic pattern, melting of glaciers, loss of biodiversity, soil degradation, air and water pollution, acid rain, siltation of lakes and river beds, extinct of species, depletion of other known natural resources, different kinds of pests of plants and animals, genetic disorder and various kinds of pests of plants and animals, genetic disorder and various kinds of diseases. It is alarming that more than 80 thousand square kilometers of forests are being stripped-off their green cover everyday, natural habitats are being lost at the global rate of 20 hectares per minute, green house gases effect the environment at an all time high, and the number of people living on less than a dollar per day has risen to above 1.1 billion (Dahya, 2000).

## How Climate affects Agriculture

In India agriculture continues to play a multi-dimensional role. It accounts for 21 per cent of Country's National Income. With regard to the workforce engaged in agriculture the earlier data reveals that while in 1961 around 75.9 per cent were dependent on agriculture it was 69 per cent in 1981 and further fell to 58.40 per cent in 2001. To sustain these huge population and also others who depend on agriculture indirectly for their livelihoods, we need to strengthen this sector. But unfortunately there has been a serious set back in the agriculture sector due to climate change. Global assessment of the impact of climate change on agriculture obscure very large variations across and even within countries. In broad terms climate change will increase the risks to and reduce the productivity of agriculture in developing countries. Vyas (2010) points out that after three consecutive good years, agricultural production has faltered in the last two years. There was a fall in production to the tune of 1.6 per cent in 2008-2009 compared to the previous year. This year, again, agricultural production is likely to be down by 2 per cent or more. The reason if not fully, to a certain extent could be attributed towards climate change. The failure of monsoon, depletion of resources, global warming and many such evils sprouts from climate change. Climate change can affect agriculture in a variety of ways. Beyond a certain range of temperatures, warming tends to reduce yields because crops speed through their development, producing less grain in the process. And higher temperatures also interfere with the ability of plants to get and use moisture. Evaporation from the soil accelerates when temperatures rise and plants increase transpiration – that is, lose more moisture from their leaves. The combined effect is called “evapotranspiration.” Because global warming is likely to increase rainfall, the net impact of higher temperatures on water availability is a race between higher evapotranspiration and higher precipitation. Typically, that race is won by higher evapotranspiration.

But a key culprit in climate change – carbon emissions - can also help agriculture by enhancing photosynthesis in many important, so-called C3, crops (such as wheat, rice, and soybeans). The science, however, is far from certain on the benefits of carbon fertilization. But we do know that this phenomenon does not much help C4 crops (such as sugar-cane and maize), which account for about one-fourth of all crops by value.

Falling production would reduce the amount of food grown by the households for their own consumption, cut supplies of local markets and diminish opportunities for employment. In Andhra Pradesh one survey covering eight districts in dry land areas found that droughts on an average occur once every three to four years, leading to losses in output value of 5-10 per cent. This is enough to push many farmers below the poverty line. Models for farm income in India as a whole suggest that a 2-3.5°C temperature increase could be associated with a net farm revenue reduction of 9-25 per cent (World Bank, 2006). We are well aware of the fact that nearly,

one-third of our population is still reeling under poverty. Most of the poor are agricultural farmers. Even when everything goes well they get limited income which meets their basic necessities. In case of droughts or floods their subsistence itself would be a great threat. Therefore it is of almost importance to take precaution to avoid such untoward natural calamities.

### **Climate Change and Human Development**

Climate change will have important implications for human developments. Around three in every four people in the world living on less than us \$ 1 a day reside in rural areas. Their livelihoods depend on agriculture and allied activities. It in this group many are poor and malnourished. A drought or a flood can cause famine in an area. Climate change impacts on agriculture will have important multiplier effects. Agriculture production and employment underpin many national economies. Famine prevention is very dependent on the political arrangements for entitlement protection. In the richer countries, such protection is provided by anti-poverty programs and unemployment insurance. Most developing countries do not have any general system of unemployment insurance, but some of them do provide emergence public employment at times of massive loss of employment caused by natural or non-natural disasters. Compensatory government expenditure in creating employment can help to avert a threatening famine very effectively. Indeed, this is the way potential famines have been prevented from occurring in India since independence – mainly through countervailing employment creation. For example, in 1973 in Maharashtra, to compensate for the loss of employment associated with a severe drought, 5 million temporary jobs were created, which is really a very large number (when account is taken of the worker's family members too). The results were extraordinary: no significant change in mortality at all, and even no great deterioration of the number of undernourished people, despite a dramatic decline (in many areas 70 per cent or more) in food production over a vast region (Sen, 2002).

Thanks to the initiative and efforts taken by the UPA government for implementing the NREGP scheme which had helped several people to get a gainful employment in our country. This to a great extent had improved the well-being of the poor and down trodden. When there is an employment in the economy. The enhancement of income of the individuals and the households at large, and this creates rippling effects in the economy. On the other hand there is plenty of evidence that unemployment leads to far-reaching effects such as loss of income, loss of skill and self-confidence lack of purchasing power leading to poor consumption, poverty, sickness, increase in morbidity and mortality, disruption of family relations and social life and a host of other evils. There is both economic and non-economic loss. The state as a visionary should consider these consequences and early efforts need to be undertaken to prevent such maladies in our country when a large proportion of the population still depends upon agriculture, which rely on monsoon and climate.

Any change in the undesired direction of the latter may cause or bring in misery to the one who depends on them.

### **Climate and Health**

Change will interact with human health in diverse ways. Those least equipped to respond to changing health threats – predominantly poor people in poor households – climate will bear the brunt on health. Health is one of the most powerful forces holding back human development potential of poor households.

### **Change will Intensity the Problem**

Malaria give rise to some of the greatest causes for concern. This is a disease that currently claims around 1 million lives annually, over 90 per cent of them in Africa. Some 800,000 children under the age of 5 in sub-saharan Africa die as a result of Malaria each year, making it the largest killer of children worldwide (WHO and UNICEF, 2005). It is a common sight now days, to see many affected by climate change. The diseases are in the form of asthma, T.B. Skin diseases, head-ache, and infection and so on. Heat waves take many lives in different parts of our country, so also is the case of heavy rainfall in unprecedented and unpredictable manner. The fierce wind which blows does carry many viruses which are harmful to human body. It is also believed that exposure of the skin to sun causes some allergy or even skin cancer. The atmosphere is so contaminated due to emission of toxic gases which are highly health hazards. Cutting down of trees, clearing forests, construction activities industrialization, urbanization, tribes setting in forest lands change in the land use pattern, converting arable land for commercial activities – all to mention a few have led to total collapse of the ecological system. When the natures balance is shaken there is furious outcome in various forms like flood, heavy rain and hot waves. If we have had good forest cover there would be adequate rain, which prevents drought or famine. Forests also protect the soil and prevent floods. When these natural assets are destroyed there is a reaction in climate itself caused by human being themselves. We are greatly responsible for this climate change. So we have to take a new turn. Nothing can be done to what is already done. At least in the years to come let us more towards protecting the nature and rediscovering ways and means to bring ecological balance.

### **Conclusion**

A joint India – UK study said, Rainfall will increase substantially in many areas while diseases such as Malaria will spread. The impact of climate change on agriculture could result in problems of poverty, unemployment, health and the livelihood security of the people. When majority of our population still depends on agriculture, the risk would be greater.

It is an admitted fact that many problems cannot be solved without the active

participation of the people. The ecological development the involvement of each and every individual big or small, rich or poor, is essential for discharging a variety of vital functions, which would preserve our ecology. Agricultural development is the need of the hour and all efforts should be adhered to push this sector to the forefront. So that this provides food, health and livelihood security to millions of people who directly or indirectly depend on this sector.

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## Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGA): A Boon to Tribal Women

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### ABSTRACT

*In a country like India, productive employment is central to poverty reduction strategy and to bring about economic equality in the society. There are estimates that over 90 percent of working women are involved in the informal sector. The National Rural Employment Scheme (NREGS) is an important strategy in the current economic content of global economic crisis and national economic slowdown, where raising aggregate demand is a major task for the government. NREGA is the first ever law internationally, that guarantees wage employment at an unprecedented scale. The primary objective of the act is augmenting wage employment. With this background a study on MNREGA was undertaken in a tribal area. The study revealed that MNREGA had been beneficial to the women in improving the livelihood.*

**Keywords : Employment, Programme, Tribal, Global, Scheme**

### Introduction

Women in India work and contribute to the economy in many ways. There are estimates that over 90 percent of working women are involved in the informal sector. The National Rural Employment Scheme (NREGS) is an important strategy in the current economic content of global economic crisis and national economic slowdown. NREGA is the first ever law internationally, that guarantees wage employment at an unprecedented scale. The primary objective of the act is augmenting wage employment. The choice of works suggested in the act addresses causes of chronic poverty like drought, deforestation and soil erosions, so that the process of employment generation is maintained on a sustainable basis. The MGNREGP provides an indispensable lifeline to the poverty stricken rural masses.

There are a series of safeguards mandated by the act. Muster rolls are supposed to be maintained at the worksite and displayed at the GP office. Payments are to be made in public in front of all the labourers, with the details of attendance and wages being read aloud from the muster rolls, so as to reduce the risk of fudged entries being made. Job cards are intended to act as a record kept with the labourers themselves of the wages they have received and the number of days they have worked. Through these there has been an attempt to create a new model of accountability in public works, eliminating corruption through the vigilance of workers themselves.

### MGNREGS in Tamil Nadu

Tamil Nadu is a leading state which has implemented this scheme and it has benefited a number of rural folks. This scheme has been renamed as Mahatma Gandhi Rural Employment Guarantee Scheme (MGNREGS). There were several community assets that were created and the generation of employment enhanced the development of community in various ways. Provisions of employment on a regular basis improved the economic and social status of the workers.

MGNREGS has given people a right to work, to reestablish the dignity of labour to ensure people's economic and

democratic rights and entitlements to create labour intensive infrastructure and assets and to build the human resources base of our country. MGNREGS has made for the first time the power elite to recognize the people's right to fight endemic hunger and poverty with dignity accepting that their labour will be the foundation for infrastructure and economic growth. It has provided a unique opportunity to people from rural India to earn their own income without any discrimination of caste or gender. Most remarkable feature of MGNREGS is that it pays women the same as men, something that was virtually unimaginable in rural India.

### Objectives of the Study

- To examine the socio-economic profile of the selected women involved in MGNREGP.
- To explore the benefits derived after joining the employment scheme.
- To suggest the measures to overcome the loopholes to make it more feasible to women.

### Methodology

Panampatti is one of the active work sites, and all the women who were involved in the MGNREGP are taken into considerations (76). Information was collected through a well structured questionnaire. Since the introduction of MGNREGP women are actively involved in various kinds of work and they do not get time to work on their own land. So during free or leisure time they work in their land.

### Socio-Economic Profile of the Women

Among the total sample size of 76 women, 78.5 women were Hindus and the rest of them belonged to other community. The marital status reveals that 86.8 percent of them were married and one was unmarried. There were nine widows among the selected groups. Sixty eight women lived in their own house while eight lived in rented house. With regard to source of lighting, 9.5 percent of the women had electricity while the rest of them used kerosene.

**Age Classification**

Women who were working under this scheme were grouped into different age classification as depicted below

Table 1: Age of the Respondents

Age (in years)	Number Stating	Percentage
20-40	46	61
40-60	26	34
Above 60	4	5
Total	76	100

Sources: Field Survey

Among the selected sample 61% belonged to young group; i.e. in the age group of 20-40 years. Around 34 % were in the age group of 40-60 years and there were only five percent who were above the age of above 60. It revealed that even the women in the senior age group were employed in this programme. It is the poverty that was prevailing in these families which forced them to work.

Table 2 : Education level of the Respondents

Education Level	Number Stating	Percentage
Elementary	15	19.7
Primary	28	36.8
High school	5	6.6
Higher secondary	4	5.3
Illiterates	24	31.6
Total	76	100

Sources: Field Survey

It is a sorry state of affair to note that, inspite of the development that had taken place there are a good number of women who are illiterates. The adult education system which was in vogue few years ago could be restarted on a vigorous ground so that they could be educated.

**Participation in NREGP**

NREGP is a programme initiated by the government to provide employment for the poor and marginalized in rural areas. The major focus of this study is to probe into several issues relating to women employed in NREGP from the specific rural area. Among the 76 women selected for the study there were nine women, where two family members were enrolled in NREGs and the rest 67 women, they were the only one involved in this programme. The scheme stipulates only 100 days of employment in a year. With respect to the number of days these women have been employed under this programme, it points out that there was a variation in this aspect. The table below brings out the number of days of employment of the selected women.

Table 3 : Days of Employment

Days Worked	Number Stating	Percentage
100-200	7	9.2
200-300	57	75
300-400	12	15.8
Above 400	0	0
Total	76	100

Sources: Field Survey

There were 12 women who had already put in 300-400 days of employment. Further 57 women (75%) had been employed for a period of 200-300 days working in various types of jobs like road construction, tank cleaning or any other kind of public work programme. Only seven women had worked for 100-200 days during the past few years. They were the new comers. While we examined their willingness to work in far off places 61.8 % answered in the affirmative, where as the rest 38 % were not willing to take up employment in far off places. For the latter group, the family situations do not permit them to leave their houses and go and work away from their homes. However all of them agree that their standard of living has improved. The ways through which it had improved their condition is given in the following table

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Table 4 : Pointers Indicating Improvement in the Standard of Living of Sample Women

Indicators	Number Stating	Percentage
Education	27	35.5
Marriage	8	10.5
Saving increase	11	14.5
Consumption increase	30	38.9
Total	76	100

Sources: Field Survey

Around 35% of the women reported that they were able to educate their children because of the increase in income. This shows that there are many in our country who cannot educate their children due to paucity of funds. There were cases where boys and girls even before the age of 8 or 10 going for work and getting pittance or some time the elder children look after the younger one at home and allowing the mother to go for work.

**Determinants of Monthly Expenditure**

To determine the influence of selected variables on monthly expenditure of the respondents, multiple regression analysis was used. The explanatory variables included in the analysis were age of the respondents (A), years of schooling of the respondents (EDU), willing at work (VW) and Debt (D).

Table 5 : Determinants of Monthly Expenditure of NREGA Women Workers

Variables	Partial Regression Coefficient	Standard Error	T value	Sig
Age	0.460	.111	0.412	0.043**
Education	-.117	.057	-2.058	.682*
Willing at work	0.428	.032	0.301	0.016**
Debt	.522	.393	1.277	0.000**

Source: field survey

\*and \*\* significant at 1 percent and 5 percent level

$R^2 = 0.54$

The  $R^2$  value of 0.54 indicates that the fit was good that is, 54 percent of the variations in monthly expenditure were explained by age, education, willing at work and debt. The partial regression co-efficient of age, willing at work and debt, was positive influence on monthly expenditure that is one unit change in these variables would bring the values .460,.428 and .522 respectively. The t values of age, willing at work and debt are found to be significant. The t value of education is found to be in significant.

Only 34.5 percent of the women are not interested to continue with this work. Women also constitute one-third of the world's wage-labour force and one-fourth of the industrial labour force. Much of women's work both within and outside the home is unpaid and therefore not counted. Nearly half of the population wanted an increase in the wage. An increase in the facilities provided at the work spot and reduction in working time was demanded by 6.6% of the sample. Around 22% of the women wanted to have more number of working days, so that they can earn a little more money.

**Conclusion**

MGNREGS is one of the largest social safety net which provides gainful employments to millions of household. It is a milestone programmes that is sure to bring manifold blessing to the teeming millions of poor people in our country. It not only provides employment guarantee to the poor women and it also empowers them by giving equal rights for both men and women. Though there are certain shortfalls in the extension and implementation of the programme. The authorities, at regular intervals should foster the effective functioning of the schemes. Every effort should be taken to strengthen such schemes. MGNREGS signals a possible reshaping of sate priorities in India through a democratic to provide livelihood opportunities for the rural poor.