Gender, Climate Change, Agriculture and Food Security

CLIMATE CHANGE, AGRICULTURE AND FOOD SECURITY (CCAFS)

TRAINING OF TRAINERS (TOT) SUMMARY MANUAL FOR INDIA

Preparing South Asian rural women to adapt to climate change

OCTOBER 2012

CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security

CCAFS

Alternative Futures

This summary manual has been written and coordinated by Aditi Kapoor, Alternative Futures, based on CCAFS Working Paper no. 12 produced by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), 2011.
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- Panchayati Raj Dept., Government of Bihar
- Dr P. Parth Sarthi, Center for Environmental Sciences, School of Earth, Biological and Environmental Sciences, Central University of Bihar
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INTRODUCTION

This Training of Trainers (ToT) Summary Manual on Gender, Climate Change, Agriculture and Food Security is designed to quickly help rural women leaders, especially elected leaders of local self-governance structures, learn training skills which they can use in their local areas to train other women on improving food security. The ToT aims at building knowledge and capacities of rural women on why the seasons are changing so unpredictably and what this means for agriculture and food security; and how women and men need to play an equally important role to tackle these challenges.

This Summary Manual, accompanied by a more detailed South Asia ToT Manual, applies to the Indo-Gangetic Plains of Bihar, India. Similar Summary Manuals are available for Nepal and Bangladesh.

According to the Inter-governmental Panel on Climate Change, South Asia, and within that the Indo-Gangetic Plains, is one of the world's most vulnerable regions to climate change impacts and is expected to witness food and water shortages following anthropogenic climate changes. Already one of the world's most disaster-prone regions, the region is also expected to witness more frequent, intense and unpredictable natural disasters like floods, droughts, cyclones, landslides, etc.

The Plains, including parts of Pakistan too, have a high population density. Historically, this region had one of the most fertile soils, favourable climate, abundant surface and groundwater for agriculture and provided food security to millions of people in the region. Today, South Asia is home to half of the world's poor and gender disparity, or the social, economic and political inequalities between men and women, is the second highest in the world, second only to sub-Saharan Africa.

The focus on gender is essential and critical because climate change is deepening the gender divide. Majority of women workers in South Asia depend on agriculture and allied activities for their living. Women comprise up to 70% of the agricultural workforce[1] in South Asia. Yet, they lack equitable access to a wide range of agricultural resources such as land, livestock, additional farm labour, education, extension services, credit, fertilizers and mechanical equipment[2] which will help them improve agriculture in the wake of climate change impacts and ensure better food security for their homes. Some recent studies[3] show that adaptation interventions are actually increasing women's time investment and work-load because women lack knowledge and resources.

This ToT Manual will help build rural women's knowledge, skills and capacities on climate change, agriculture and food security and empower them to access resources, especially government resources, to successfully adapt their agricultural-related livelihoods to the climate change impacts. This is a collaborative step taken by CGIAR-Climate Change and Food Security and Alternative Futures to ensuring better food security for rural women and their families.

1 The Lancet and University College of London Institute for Global Health Commission (2009): Managing the Health Effects of Climate Change.
2 FAO (2011): The State of Food and Agriculture 2010-11. Food and Agriculture Organization of the United Nations, Rome.
3 Kapoor, Aditi (2011): Engendering the Climate for Change: Policies and Practices for Gender-just Adaptation, Alternative Futures, New Delhi. http://alternativefutures.org.in/userfiles/Engendering%20the%20Cilmate%20for%20Change.pdf

GENDER, CLIMATE CHANGE, AGRICULTURE AND FOOD SECURITY

TRAINING OF TRAINERS (TOT) PROGRAMME, PATNA, BIHAR

JOINTLY ORGANISED BY

CGIAR - CLIMATE CHANGE, AGRICULTURE AND FOOD SECURITY (CCAFS) PROGRAMME, ALTERNATIVE FUTURES AND BIHAR MAHILA SAMAKHYA SOCIETY

TRAINING SCHEDULE

OCTOBER 5-6, 2012

PATNA, BIHAR

DAY 1			
Session	Session Time	Session Description	Facilitator
1	9 am to 10.15 am	Welcome Introducing the organizations and the objective/ purpose of the training *Presentation: "Climate Change, Agriculture and Food Security in South Asia: A gender perspective"/CCAFS* Introductions and Participants' Expectations/ Learning objectives	MS MS/AF/CCAFS MS/AF
2	10.15 am to 12.30 pm	Understanding the issues: [a] Climate Change: the science and its impact on agriculture/food security [b] What is 'gender?' [c] The gender dimension to climate change, agriculture/food security	 AF MS AF/MS
TEA TO BE SERVED TO THE GROUPS AT AROUND 11.15/11.30 AM			
3	12.30 pm to 1.30 pm	Climate change and agriculture in Bihar Discussion with a focus on the gender dimensions	Dr Pradhan Parth Sarthi, Associate Prof, Centre for Environmental Sciences, Central University of Bihar, Patna MS/AF
LUNCH			
4	2.30 pm to 3.45 pm	Bihar's agricultural initiatives in the wake of climate change to ensure food security with a focus on mainstreaming women farmers Discussion with a focus on the gender dimension	Mr A.C. Jain, Dy Director (Information), Agriculture Department, Bihar Mr R.N. Singh, BAMETI (Agriculture Extension Work)

DAY 1 (Contd.)			
Session	Session Time	Session Description	Facilitator
5	3.45 pm to 4.30 pm	Learning from adaptive agriculture in flood-prone Eastern Uttar Pradesh Report on agriculture adaptation in the field and the role of government programmes and schemes	Gorakhpur Environmental Action Group (GEAG), Gorakhpur, E. Uttar Pradesh
TEA			
6	4.45 pm to 6 pm	The role of Panchayat women leaders in making village development plans and accessing government schemes for climate change adaptation.	Ms Seema Singh, Training Wing, Panchayat Raj Department, Bihar
7	6 pm to 7 pm	Putting Learning into Practice: Group work on Action Plan for PRI Women Leaders to ensure adaptive agriculture and food security	AF/MS Ms Seema Singh Mr A.C. Jain
8	7 pm to 7.45 pm	Films on Women and Climate Change	GEAG/AF
DINNER AT 8 PM			

DAY 2			
Session	Session Time	Session Description	Facilitator
1	9 am to 9.30 am	Recap of Day 1	MS
2	9.30 am to 10.30 am	Continue group work on Action Plan for PRI Women Leaders to ensure adaptive agriculture and food security	AF/MS
3	10.30 am to 11.30 am	Presentation of Action Plans and discussions	AF/MS
TEA			
4	11.45 am to 1 pm	Schedule/Discussion for District-level trainings	MS/AF
5	1 pm to 2.00 pm	Feedback and Wrap-up	MS/AF
LUNCH AT 2 PM			

TRAINING SESSIONS METHODOLOGY, EXPLANATION AND INFORMATION

SESSION 1

Welcome, Introductions and Expectations/Learning Objectives	1 Hour 15 Min

METHODOLOGY

A. Welcome

Short welcome by the host organization **(2-3min)**

B. Introductions

I. Facilitator (s) introduces the training purpose through flash cards/powerpoint presentation/participatory discussion **(5-7 min)**

II. Introduces the 3 host organizations either by inviting the organizational heads presenting the information himself/herself **(7-10 min)**

III. Invites all the participants to pair up, introduce each other and list their partner's a expectations from the training. **(1 hour)**

EXPLANATIONS AND INFORMATION

B. Training purpose	
I. Training Purpose (two-fold)	**Additional information** ***Participants can be asked questions to lead up to the purpose of the training. Depending on time, a couple of participants can also share their perceptions briefly.***
1. To be aware about the changing nature of seasons and the weather; and how these changes affect men and women farmers differently.	Questions: ■ Do you think seasons – summer, monsoons, winters – have changed in any way over the last 1-2 decades of your life? ■ Can you think of an example where these changes are affecting your life and your livelihoods in any way? Give one example of how the change is affecting you and how its affecting your spouse?
2. To learn what elected women leaders can do to help men and women farmers deal with these changes to ensure improved agriculture production and better household food security.	■ Can you share one example where you may have done something to deal with the seasonal change in your field/kitchen garden/poultry? ■ Can the Panchayat do anything to help people adapt to the seasonal changes? Can you give an example?

II. Host Organisation	Information about the organisation
CGIAR-CCAFS	The Consultative Group on International Agricultural Research (CGIAR) is a global research initiative that brings together 15 research centres across Asia, Africa, Europe, North America and South America. The purpose of CGIAR is to reduce rural poverty, increase food security, improve human health and nutrition and ensure more sustainable management of natural resources through scientific and social research. The CGIAR works in close collaboration with hundreds of partner organizations, including other research institutes, civil society organizations, academia and the private sector. The CGIAR Climate Change, Agriculture and Food Security (CCAFS) programme is a 10-year research initiative in collaboration with the Earth System Science Partnership for a food secure future. The CGIAR-CCAFS Programme seeks to overcome the threats to agriculture and food security in the wake of climate change. It does this through researching and exploring new ways of helping vulnerable rural people adapt to the impacts of climate change. CGIAR-CCAFS believes that men and women are affected differently by climate change. They also respond differently to the impacts and adopt different ways to safeguard their lives and livelihoods. Men and women also have unequal access to knowledge and resources to help them adapt to climate change. Thus, it is necessary to use a gender lens to understand the impacts of climate change and to ensure that with men, women are also able to be equal agents of economic and social change.
Alternative Futures	Alternative Futures is a development research and communication group working on creative and meaningful alternatives, policy, social and technological innovations for development and social change. It is inspired by the vision of a society based on the principles of *ecological sustainability, social justice, spirituality and cultural pluralism.* AF looks at change in a holistic manner, even while working on various specialized issues like climate change. It focuses on innovative efforts for sustainable development, social transformation and democratic, transparent and accountable governance in all sectors of society. It also seeks to create an expanding community of willing change-makers who can help us all move towards an alternative future that is more humane, just and sustainable. Through its inter-disciplinary research on the future of society, AF promotes alternative and preferred futures. Activities undertaken by AF include policy research and advocacy; field research and surveys; sector studies; inter-disciplinary foresight studies; writing of background papers and resource manuals; and designing and conducting training programmes.
Mahila Samakhya	Bihar's Mahila Samakhya (MS) Programme works on the principle of 'Education for Women's Equality,' focusing on education and training as a means to greater empowerment of women. 'Education' for MS does not just mean acquiring the basic literacy skills but a process to learn to question, critically anayse issues and problems and to seek viable solutions. Through education and training, MS endeavours to create an environment for women where they can seek new knowledge and information, learn at their own pace and make informed choices. This includes working on empowerment women to know about and benefit from major government programmes and schemes affecting their health and livelihoods. Trainings on the Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA), for instance, is one such continuing initiative. Mahila Samakhya started its work in Bihar 1992 as part of the Central government's programme on educating adult women and is currently working in 14 districts. While a major thematic area of work is violence against women, MS has also been encouraging and supporting women to stand for elections in the local Panchayat bodies, especially with Bihar's 50% reservation for women in Panchayat Raj Institutions.

Participants' introductions

- All the participants stand in a circle holding hands.
- They drop hands, stand where they are and form 2 parallel lines.
- Each person partners the person opposite her.
- The partners seek introductions from each other and ask each other's expectations from the training.
- After 5-7 min, they form the circle again and each person introduces her partner and articulates the expectation her partner has from the training.

SESSION 2

Understanding the Issues — 2 Hours 15 Min

METHODOLOGY

[a] Climate change: the science and its impact on agriculture/food security (Sub-total 35 min)

- Science of climate change: Illustrations & explanation by the Facilitator **(15 min)**
- Impact of climate change on agriculture/food security
  - o Responses from the audiences written on a flip chart **(10 min)**
  - o Share flip charts; then share 5-7 Flash cards/powerpoint presentation on cause and effect **(10 min)**

[b] What is 'gender?' (sub-total 15 min)

- Group discussion on biological and social aspects of men and women

[c] The gender dimension to climate change, agriculture/food security (Sub-total 1 hour 25 min)

- Group discussion on gender differences with respect to farming as a livelihood by making a list of agriculture-related tasks for men and women **(30 min)**
- Group work on linking gender, climate change, agriculture and food security
  - o Make groups of 5 people each.
  - o Each group works on the basis of two examples:
    - Seasonal/climatic/weather changes
    - Gendered tasks on agriculture-related livelihoods
    - Each group writes on a flip chart the difference the weather changes are making to (a) their agricultural tasks and (b) to their household food security. This is done after group discussion so that everyone's points are noted - on the flip chart **(30 (15x2) min)**
    - Each group puts up the sheets in the room **(5 min)**
- Plenary discussion on climate change, how it affects agriculture, gender **(30 min)**
- Conclude and flag questions:
  - o Is gender at all important for food security in the wake of climate change?
  - o Do women have the resources and the capacity to deliver climate solutions?
  - o Does class, caste, religion, type of livelihood, etc. play a role when considering gender, climate change, agriculture and food security?
  - o What is the role that elected women leaders in the Panchayat can play?
  - o What are 2-3 government schemes that elected women leaders can access to help adaptation in agriculture-related livelihoods to ensure food security?

EXPLANATIONS AND INFORMATION

[A] CLIMATE CHANGE: THE SCIENCE AND ITS IMPACT ON AGRICULTURE/ FOOD SECURITY

The Science of Climate Change

Climate changes occurs naturally but human activity can influence faster changes

Climate is the study of weather over hundreds of years. Weather can change every day but a climate of a place stays the same for centuries. So the climate of Bihar will be hot for 4 months in summers, cold for 3 months winters. It will have a 3 month monsoon season and pleasant but short spring and autumn. In other places, like in Kerala, the climate is always hot or warm, never cold.

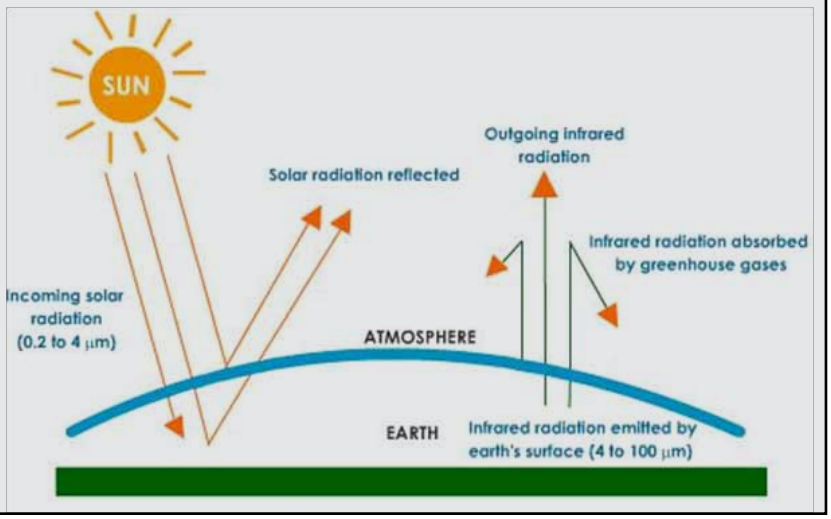
Planet Earth's climate has always been changing. Scientists talk about ice ages when the Earth was covered with ice. As the sun heated the earth up, the ice would melt and the Earth's climate would become more moderate for life forms. This phenomena occurs and re-occurs over thousands of years. So seasons change over thousands of years as part of a natural phenomenon.

Today, however, we are seeing seasonal changes very rapidly, within a few decades. This is happening due to 'global warming' where the planet's temperature is rising faster due to certain human activities. **When global temperatures change they influence the earth's climate.**

UNDERSTANDING THE SCIENCE OF CLIMATE CHANGE

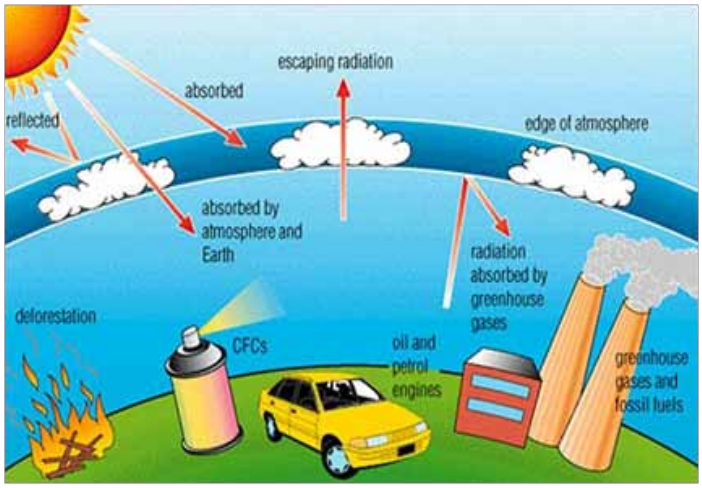
THE STORY OF THE SUN, THE EARTH AND THE ATMOSPHERIC GASSES

The rays of the sun enter our earth and bring us warmth. The atmospheric layers around the earth, made up of 'greenhouse' gasses like carbon dioxide, methane, water vapor, etc, prevent most of this heat from leaving the earth. These gasses are called greenhouse gasses (GHGs) because they act just like the greenhouses where we grow our horticulture plants. The gasses trap the heat on the earth and do not allow it to escape. So we can grow plants; and man and animals can live comfortably in temperatures that are not too hot, nor too cold.



THE STORY OF THE INCREASING GASSES IN EARTH'S ATMOSPHERE

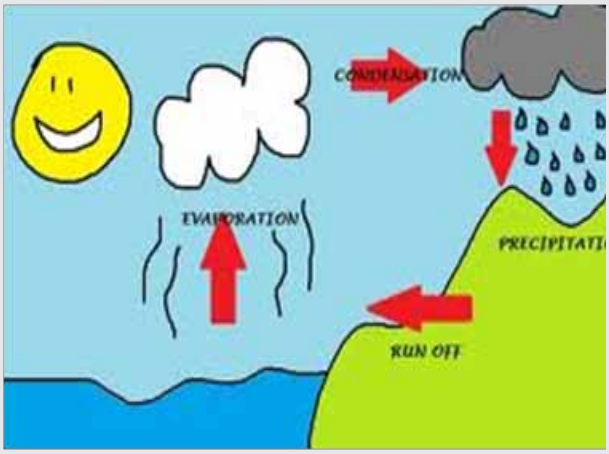
When rich, western countries of United States of America, Canada, Europe, Australia, Japan and Russia developed rapidly, they expanded industrialization, transport and electricity in their countries. All these primarily used fossil fuel - coal, petroleum products, natural gas. These were extracted from under the ground and burnt. They emitted large amounts of GHGs. High chemical-based agriculture, mainly practiced in these countries, also emitted GHGs. This 'industrial revolution' started about 150 years ago and since then lots of fossil fuel has been burnt to emit huge amounts of GHGs. These rapidly growing GHGs have been trapping the sun's heat rays on earth. They now form a one-way blanket that does not allow the earth's heat to escape. This is called 'global warming.'



Source: www.homahku.com

During the 100 years between 1906 and 2005, the earth's temperature increased by about 0.74 deg Centrigrade on an average – more in some places and less elsewhere. While some amount of gasses are good for Earth, too much too soon is not good and causes climate change. The increase in temperature is causing the sea level to rise causing danger to coastal areas.

To deal with this, governments are now promoting non-fossil fuel, or 'renewable' sources of energy. These include energy from the sun, called 'solar power' as well as energy from the wind and from ocean currents called 'tidal power.' India and other countries have also been promoting biomass energy by burning a lot of waste that comes from animals, plants and trees. Our biogas stoves are an example of this 'climate-friendly' form of energy.



Source: http://theliberalzombie.wordpress.com

THE WATER STORY BEHIND CLIMATE CHANGE

Nature has a simple rule. The lighter hot air rises and the heavier cold air sinks. When the earth absorbs the sun's heat, land becomes hotter quicker than its seas and oceans. Hot air from land rises and sea air, which is still cool, rushes in as 'sea breezes.' At night, land is cooler than the sea. Land loses its heat faster than water. So hot air rises from the sea and cooler air from land blows out into the sea as 'land breeze.' Simultaneously, another cycle is happening. Hot air rises in the form of water vapor. When the water vapor cools down as it goes up, it condenses to form clouds. When clouds hold too much water vapor, they come down as rain.

When global temperatures change they influence the sea- and land-breeze and change the earth's climate.

IMPORTANT DIMENSIONS OF CLIMATE CHANGE

1. **Global climate change affects local people and processes.**

2. **Solutions to climate change require both:**

Climate change is a global phenomenon but its impacts are local.

Emissions from different countries cause global temperatures to rise and this changes the pattern of sea breezes and land breezes, giving rise to weather changes across the world.

These changes are felt by local people and this affects local people's livelihoods.

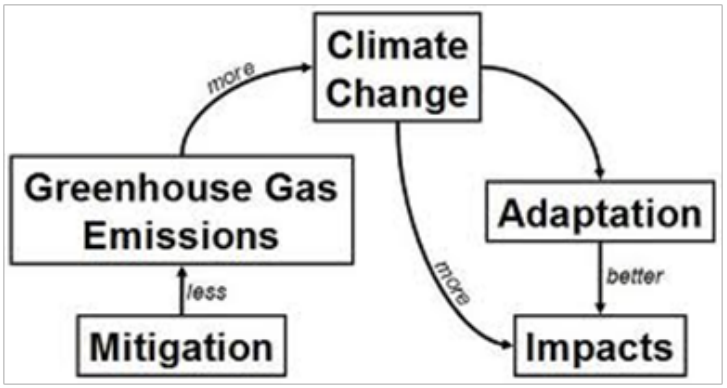
Especially, livelihoods of people who are socio-economically and politically less equipped to handle these changes – like small & marginal women and men farmers.

- Mitigation – reducing greenhouse gas emmisions
- Adaptation – coping, adjusting and dealing with climate change impacts

Both mitigation and adaptation are necessary.

Mitigation is critical because there are limits to how much human beings can adapt.

Existing GHG emissions will continue to affect the earth's climate for many decades.



Source: http://e-education.psu.edu

3. Politics of climate change

- Politics of climate change is preventing fast action on dealing with this crisis.
- 197 developed and developing countries have agreed to find solutions to the climate change crisis together under the aegis of the United Nations. These countries have signed the **UN Framework Convention on Climate Change (UNFCCC)** and are regularly having discussions. The goal is to come to an agreement by consensus to lower emissions and help poorer countries adapt to climate change.
- Unfortunately, the discussion have become negotiations where the more developed countries do not want to change their people's lifestyles to lower emissions; and the developing countries are unable to put pressure on the developed countries to do so because they are economically dependent on many of these countries for survival. The developing countries are also at very different levels of development to come to a common agreement. Thus, for instance, China, still a developing country with many poor people, and the rich United States of America are the world's worst emitters of GHGs. India, home to the world's largest number of poor people (about 30 crore) who also do not have access to energy, is the world's fifth largest emitter of GHGs.
- The politics of climate change is stopping the world leaders from taking any concrete action to lower emissions or to aid adaptation.
- Climate scientists fear that if the current situation continues, the earth's average surface temperature may increase by 3-4 degree Centigrade in the next 50 to 100 years, which will be catastrophic for all life-forms, including agriculture and food security. Under the United Nations, the world's climate scientists have come together under the Inter-governmental Panel on Climate Change (IPCC) and are continuously contributing studies on climate trends and climate projections.

IMPACT OF CLIMATE CHANGE ON AGRICULTURE/FOOD SECURITY

Group work

- Responses from the audiences written on a flip chart
  - What changes are you seeing in the pattern of the seasons with regard to temperatures, rainfall , winds? Also with regard to disasters – floods and droughts?
  - Give examples of what this does to your farming practices and the agricultural cycle?
  - Share information on flip charts

- Share flip charts then share 5-7 Flash cards/powerpoint presentation (ppt) on cause and effect (see table below for flash cards/ppt)

CLIMATE CHANGE AND IMPACT ON AGRICULTURE: CAUSE AND EFFECT Examples for Flash Cards/Powerpoint Presentation		
Cause: Changes in Seasonal Patterns	**Effect: Impact on Agriculture**	**Effect: Impact on Household Food Security**
Delayed rains	Delayed sowing of paddy so delayed agricultural cycles	High
Changed rainfall pattern – more spaced out and more intense	Crops don't get water when they need it; leads to agricultural drought Untimely and intense rains spoil harvested paddy	High
Higher summer temperatures	Less milk from milch cattle Reproductive cycles of cow/buffalo lengthening More agricultural pests	High
Longer summers; late onset of winters; shorter winters	Delayed rabi cultivation; early hot winds stunt maturing of crop – these changes affect quality and income	High
Intense rains	More flooding, breaking of embankments, more water-logging – all affect agriculture production and soil fertility	High

[b] What is 'gender?'

Group discussion on biological and social aspects of men and women through questions such as:

Developing an understanding on gender:

- What is gender?
- Where do you see gender-based discrimination between men and women in the following areas:
  - Food and nutrition
  - The way we live and behave
  - Dress code
  - Education
  - Health and well-being
  - Etc. (add more areas here)

[c] The gender dimension to climate change, agriculture/ food security

- Group discussion on gender differences with a focus on farming.
- Make a list of agriculture-related issues/tasks and discuss each from a gender perspective – what it means for men and for women.
- Discussion will be based on questions like:
  - Who owns the farm land? (mainly men)
  - Who does what and how much farm work?
  - Who has control over income?
  - Who takes decisions over buying and selling of farming assets/produce?
  - Who is mainly responsible for sowing, harvesting, threshing, drying, processing and storing of grain? (mainly women)
  - Who keeps a regular watch over the field and ensures that all work is done on time and done well?
  - Who sorts and stores seeds?
  - Who ploughs the land/uses the hoe etc?
  - Who is responsible for collecting fodder and water for the animals, keeping them and the area clean?
  - Why are women forbidden to handle seeds, especially during their menstrual cycle?
  - Why are women not permitted to control income from selling of cash crops, vegetables and other crops sold in the market?
  - Etc. (Add issues here)

- Group work on linking gender, climate change, agriculture and food security

Based on the above plenary (includes all participants) discussions, each group writes on a flip chart, 3-5 examples of the difference the weather changes are making to (a) their agricultural tasks and (b) to their household food security. The format for the flip chart is given below:

LINKS BETWEEN GENDER, CLIMATE CHANGE, AGRICULTURE AND FOOD SECURITY Draw this table on your flip chart and fill the columns with 3-5 examples each				
Climate change indictor	**Impact on agriculture task**		**Impact on food security**	
Rainfall, temperature, winds, disasters	Women	Men	Women	Men
EXAMPLE Higher temperatures	EXAMPLE Lower milk production though more work to get fodder and water for animals	EXAMPLE Less farm work potential so seasonal migration	EXAMPLE High food insecurity	EXAMPLE Medium food insecurity

This is done after group discussion so that everyone's points are noted - on the flip chart. The examples in the table above can be shown after the groups have shared their flip charts and before the plenary discussion on the flip charts starts.

LINKS BETWEEN GENDER, CLIMATE CHANGE, AGRICULTURE AND FOOD SECURITY			
Climate Change impact on Agriculture	**Gender Discrimination**	**Impacts on Women, their work and well-being**	**Impacts on Men, their work and well-being**
Lower food production	Boys and husbands eat first and are offered the more nutritious food	Least to eat; sleep on an empty stomach Need to take on additional work as wage labour – feminisation of agriculture labour	1st priority to available food
More floods, more water-logging, agricultural droughts, delayed rains, lower biomass, drinking water shortages	Disasters lower women's life expectancy more than men; women, girls and young boys are 14 times more likely than men to die during a disaster.[4]	Longer walks to get water and fuelwood Loss of fodder and livestock – primarily women's livelihood Drought/infrequent spells of rains – harder ground to do work on	Mobility, ability to participate in community-decision-making, ability to participate in protests, distress migration for alternative wage labour
Higher summer temperatures	Pregnant women feel hotter than usual; lactating mothers lose water and feel more thirsty so need more water; most women's tasks, unlike men's tasks, are labour-intensive, not aided by farming instruments/ machines	Lower milk production among animals More tiring work in fields even in spring months (March-April) Longer waking hours – early morning work in the field to avoid the hot sun later in the day	Responsible mainly for ploughing before the start of the summer; very few regular tasks in the field Distress migration

4 Source: UNDP, Gender and Disasters, http://www.undp.org/cpr/documents/disaster/7Disaster%20Risk%20Reduction%20-%20Gender.pdf

Effect on regeneration of species	Women have a greater responsibility to ensure there is enough food in the house for the family – so they rely a lot on 'ready-to-eat' food naturally regenerating wild food plant and fish varieties in forests and rivers. Men are more responsible for getting enough cash incomes.	Naturally growing medicinal herbs, fodder, wild fish/food more difficult to get	Distress migration
Heavy rainfall	Women shoulder 60-80% of the farming, processing 'out-door' tasks, including fetching fuelwood, fodder and water.	More weeding jobs Water, fodder, fuelwood difficult Excess rains/low rainfall, women's opportunity for wage employment declines	
Untimely rainfall	Women are more vulnerable to risks than men because they have lesser knowledge, authority and opportunities than men.	Repeated sowing, sifting damaged harvest, added burden due to male migration as a result of lower farm production; not able to plan work and care responsibilities.	Distress migration
Social impact – higher indebtedness	Women go to take loans and have the responsibility to pay off loans!		Distress migration
Social impact – male migration	Women-headed families are poorer, live in more insecure environments and this leads to trafficking/HIV AIDS.		
Social impact – domestic violence	Falling of incomes and economic prospects among men leads to an increase in domestic violence – several studies including World Bank study across several countries.		

Adapted from Kapoor, Aditi (2011) 'Engendering the Climate for Change: Policies and Practices for Gender-just Adaptation' A Policy Research Report, Alternative Futures/Heinrich Boll Foundation, New Delhi. http://alternativefutures.org.in/userfiles/Engendering%20the%20Cilmate%20for%20Change.pdf

SESSION 3

Climate Change and Agriculture in Bihar — 1 Hour

METHODOLOGY

- **Based on Session 2, participants will volunteer to share 3 climate change indicators in Bihar and 3 impacts of climate change on agriculture and their work to set the tone of Session 3.**
- **Dr Pradhan Parth Sarthi will give a power point presentation on the topic.**
- **The plenary discussion will draw out the gender and food security issues. This will be written on a flip chart and noted in the manual by the participants.**

EXPLANATION AND INFORMATION

Presentation by Dr P. ParthSarthi,
Center for Environmental Sciences, School of Earth, Biological and Environmental Sciences, Central University of Bihar, Patna. Email: drpps@hotmail.com

The impact of climate change on different geographical location, sector and gender is not the same and is, in fact, unequal.

The impact of climate change in tropical, extra tropical and polar regions is different. Effects of climate change on agriculture, water resources, forest, health and other sectors differ in different regions. Therefore, the maximum impact of climate change in a particular sector over a geographical location is unique and so very important. Men and women are affected differently by climate change because their socio-economic roles in society are different; men and women also have different education, opportunities, authority and resources in society so their responses to climate change also differ.

In India, agriculture is critical to the overall development of the country. Agriculture is the backbone of Bihar's economy where 81% of workforce is employed in the sector which generates nearly 42% of the State Domestic Product. Therefore, agriculture is the main source of income for a large number of Bihar's population, especially in the absence of any other major industry.

The state's agricultural production and soil fertility is hugely affected by floods and droughts almost every year. The change in the frequency of droughts and floods in recent years is due to the impact of climate change. Almost every year, there are large fluctuations in the Indian Summer Monsoon Rainfall (ISMR). Recent changes in winter temperatures are also due to climate change and have affected the State's wheat production. But the relationship between climate change, agriculture and food security and their effects on men and women are not yet well documented in Bihar's scientific literature. This is due to non availability of reliable data on gender, agriculture, food security and climate change.

The state of Bihar is located in the eastern part of the country, between latitude 24°-27° N and longitude 82°-88° E, with a total geographical area of 94,163 sq. km. The Bihar plains are divided into two unequal halves by the river Ganga which flows through the middle from west to east. The Ganga is the main river which is joined by tributaries with their sources in the Himalaya. Some of the tributaries, north of the Ganga are Saryu (Ghaghara), Gandak, BudhiGandak, Bagmati, Kamla-Balan and Mahananda. There are some other rivers that start from the plateau, located to the south of the Ganga area, and meet the Ganga or its associate rivers after flowing towards north. Some of these rivers are Sone, Koyal, Punpun, Panchane and Karmnasha. Regions to the north of the Ganga are generally flood-prone, whereas the southern regions are generally drought-prone, especially districts Munger, Nawadah, Rohtas, Bhojpur, Aurangabad, and Gaya.

Rainfall and temperature are the two main climatic variables which affect agriculture, water, forest, health and other sectors. Thus, it is necessary to understand the past, present and

future trends of rainfall and temperature in Bihar. The future projection, or trend of climatic variables, is being done by climate scientists using very complex 'Climate Models.' To provide future projection of climatic variable on a regional scale, the Regional Climate model, PRECIS is being used by the Central University of Bihar, Patna. Based on the observed data for the period of 1871-1990, the mean (or average) annual surface temperature shows increasing trend in northwest and southwest regions of Bihar. The future projected mean annual surface temperature under high emission scenario during 2071-2100 shows change of 4°-5°C. Similarly the mean temperature in May shows change of 1°-2°C.

In Bihar, the region of north of the Ganga receives good amount of monsoon rainfall in comparison to the region south of the Ganga. The average rainfall received in the eastern part of the State is 100-120cm of rainfall during Indian Summer Monsoon Rainfall (ISMR) whereas the western part of the State receives 80-100cm of rainfall. Districts that lie south of the Ganga, show significant decreasing trend in ISMR. The future projected ISMR, based on PRECIS model, shows overall change of 5cm during June-July-August over Bihar. During 2011-2040, the future projected change in ISMR, based on climate models, is showing both surplus and deficit ISMR in different parts of Bihar. Central Bihar, especially, is showing surplus ISMR.

Based on observed long data series of Indian Meteorological Department (IMD), it is found that Bihar as a whole has experienced 5-6 monsoon drought years in the last decade (2001-2010); only 2 monsoon flood years have been identified in the same decades. All districts of Bihar are showing negative trend of ISMR since 1991. It is very clear that in recent years Bihar has been experienced a deficit in ISMR. In fact, the water table is continuously going down and creating a very difficult situation (lack of drinking water, lack of water for irrigation and animals) during the summer (April-May) season, especially in rural areas. This particularly affects women as fetching water for the house and for animals is primarily their responsibility.

Men and women farmers in drought - and flood-prone districts should respond to long-term changes in climate. Constant food availability, an indicator for food security (according to World Heath Organization), will be badly affected due to this long-term climate change. There is an urgent need to provide proper information to small farmers about the changing climate in terms of temperature and rainfall so that they can plan appropriate coping strategies against impact of climate change. Due to the droughts and floods every year, small farmers are migrating from rural to urban areas for better work prospects. Men and women demonstrate different preferences for longer-term coping strategies. In response to climate change, men prefer to migrate in search of wage labour as a coping strategy; women prefer local wage labor because it is primarily their responsibility to look after the family – the elders and the children - in the village.

SESSION 4

Bihar's Agriculture Initiatives in the Wake of Climate Change to Ensure Food Security With a Focus on Mainstreaming Women Farmers	1 Hour 15 Min

METHODOLOGY

- **Begin by asking participants to list government's agricultural schemes – to be written on a flip chart by the facilitator**
- **Ask participants to identify from among these schemes those that may be of help in the wake of seasonal changes – climate change. Facilitator to enter this on a separate flip chart and note the main reason(s). This is to be done for about 5 government agriculture programmes/schemes**
- **All of the above to be noted by the participants on their notes pages**
- **Address by government agriculture representative(s)**
- **Plenary discussion with a focus on gender and food security. Points to be noted by the facilitator on a flip chart and copied by the participants.**

EXPLANATION AND INFORMATION

Presentations by
Mr. R.N.Singh, BAMETI and
Mr. A.C. Jain, Agriculture Department, Patna, Bihar

Panchayat leaders can facilitate farmers to avail many of the benefits from Bihar government's various agricultural schemes. Agriculture Technology Management Agency (ATMA), for instance, is one such scheme. Some of the schemes are also mentioned in the State government's strategy to support and promote Kharif (summer) and Rabi (winter) crops. Women panchayat leaders must inform themselves of these benefits and then help women farmers avail these. Several of the government schemes help in overcoming the impacts of climate change and ensuring greater food security.

AGRICULTURE TECHNOLOGY MANAGEMENT AGENCY (ATMA)

ATMA has been established in each district of the state. Its aims and objectives are:

- To create a new organisational character for supporting propagation of agriculture.
- To coordinate the promotional activities being carried out by various departments, agencies, NGOs, private companies, agricultural organisations, and thus bring about a unity in their programs in order to encourage private-public partnerships.
- To undertake comprehensive promotional programs with the objective of fortifying programs already established, keeping in mind the various agricultural methods.
- To increase the capacity of various farmer organisations for propagation of agriculture.
- Keeping in view the gender dimensions of agriculture, working towards empowerment of women farmers.
- To strive for financial stability with respect to promotional programs.

Special features of ATMA

- To implement ATMA in a 'Mission' mode, accountability to district authorities, for all stakeholders engaged in promotion of agricultural at all levels.
- To bring improved technology to farmers and to increase agricultural production according to their capacity.
- To monitor the spending and distribution of funds to ensure timely benefits for farmers.
- To lay down district-wise targets for the proposed entities in accordance with the District Plan (this is where a pro-active role of the Zilla Panchayat and the Gram Panchayat is critical).

Bihar Agricultural Propagation and Management Training Institute (BAMETI)

Bameti is a state-level training institute, and plays a significant role in creating techniques for the propagation of agriculture in the state. Its aims are:

- Work as a nodal agency for the development needs of department workers and administrators concerned with agriculture, horticulture, pisciculture, animal husbandry and other related activities
- Ensure coordination between agricultural workers, administrators, and scientists to increase research in and propagation of agriculture.
- Ensure co-ordination between state-, national-, and international-level institutions to benefit from work being done on disaster management, rainfed agriculture, control of pests, agricultural practices related to sowing of seeds and harvesting of crops.
- Work according to the needs and characteristics of districts where ATMA is in operation.
- Employ researchers through ATMA for the advancement of the agricultural sector.
- Ensure cooperation between agricultural research/sciences sector, agriculture universities, NGOs and government agencies.

Bihar Government's Strategy for Kharif 2012

- Promote cultivation of high yielding and hybrid varieties of seeds in 100% irrigated areas and timely cultivation of suitable crops in un-irrigated areas.
- Distribute foundation seeds of paddy through the Bihar State Seeds Corporation to two farmers in each village at 50 % subsidy.
- Spread awareness and promote balanced use of fertilizers (nitrogen, phosphate and potash) in the ratio of 4:2:1. Also propagate and promote use of organic fertilizers to maintain the productive health of the soil; support farmers to cultivate organic fruits and vegetables.
- Collect 5 samples of soil from each village and get them examined in the soil research laboratory.
- Give 50% subsidy on the cost of 5 H.P. pump sets or a maximum subsidy of Rs 10,000 per pump set to farmers in select districts.
- Select 5 progressive famers in each Panchayat to support them to use improved farming techniques.
- Make available to farmers all high quality inputs such as seeds, fertilisers and pesticides.
- Make available to farmers modern farm equipments at subsidized rates under various schemes.
- Make farmers aware of the various facilities offered by the Food Corporation of India and other organizations for the purchase of paddy at the minimum support price.

Bihar Government's Strategy for Rabi 2012

- Under the National Food Security Mission, 25 districts of the state have been selected for the cultivation of wheat. In order to increase the production of wheat emphasis will be laid on timely sowing, availability of certify seeds, irrigation facility, balanced use of fertilizers based on soil tests and the use of suitable equipments for insecticide operations.
- Under the National Food Security Mission, farmers in 12 districts will be given Rs 3000 per acre to cultivate Boro Rice (*Boro Dhan*).
- Funds have been allocated per acre for proper cultivation of wheat, including zero-tillage cultivation.
- In order to increase the production and productivity of corn in the rabi season adequate arrangements will be made for the distribution of certified seeds, use of balanced fertilizers based on soil test, insecticide operations, etc.
- Under the National Food Security Mission, full support is being provided to farmers in 12 districts to grow pulses. In the remaining 25 districts too, support is being given to provide seeds and to promote knowledge and adoption of rhizobium culture to increase the production of pulses.
- Funds have also been allocated per acre to promote production of linseed and lentils.

SESSION 5

Learning from Adaptive Agriculture in Flood-Prone Eastern Uttar Pradesh with a Focus on the Role Of Government Programmes and Schemes — 45 Min

METHODOLOGY

- **Presentation by a practitioner of adaptive agricultural practices from Gorakhpur, Eastern Uttar Pradesh. The focus will be on gender and food security and the role of government programmes and schemes in ensuring adaptive agriculture.**
- **This will be followed by a discussion.**

Eastern Uttar Pradesh has been chosen because its agro-climatic zone is similar to Northern Bihar.

EXPLANATION AND INFORMATION

Presentation by Mr. K.K. Singh
Gorakhpur Environmental Action Group (GEAG), Gorakhpur, E. Uttar Pradesh. Website: www.geagindia.org

Vegetable nursery in flood prone areas: A profitable occupation

In flood-prone areas, even a slightly elevated land is well-suited for production nurseries. In flood-prone areas villages and houses are usually built on elevated land. This is where people and their animals live. Part of this land is also used to grow vegetables and fruits. Using this land to cultivate fast growing high-value crops in nurseries is a viable and profitable alternative livelihood during the flood season. After the floods recede, crops can be grown on the farms. In these nurseries, farmers usually opt for food crops and cash crops that have a ready market. Thus, there is an increase in the demand for seeds, saplings and other inputs. Growing vegetables in nurseries can easily be learnt by farmers, especially those that live in areas that are experiencing recurring floods annually. This adaptive activity can be promoted by the State Horticulture Mission, especially for small and marginal farmers.

Livestock breeding in flood prone areas

Padiya is the Hindi name for the female offspring of a buffalo in Eastern Uttar Pradesh. Buffalo calf breeding, compared to other animals, is a viable livelihoods option in flood-prone areas. This is because buffaloes can survive longer periods in water compared to cows, bulls, goats etc; they can also swim short distances to come out of the flood waters onto the available elevated dry land. Thus, fewer buffaloes perish during floods, compared to other animals. Buffalos fetch a good price in the market and milk yield from a full grown buffalo is also profitable. Breeding buffalo calf is a sound adaptive mechanism because it serves as an alternative livelihood option during the flood season and even after the floods recede. In fact, the income from buffaloes post the floods can compensate farmers for the losses incurred during the floods.

Collective effort strengthens livelihood

Village Jangal Agahi is a flood-prone village in the administrative block of Campierganj in district Gorakhpur, Eastern Uttar Pradesh and gets water-logged due to floods. This was the biggest challenge for the villagers. Water-logging submerged 75% of their fertile agricultural land and the waters stood there even when the floods receded. In the year 2008, a group of villagers mobilized other villagers and sought support from the Gram Panchayat, their local self-governance body, to make a village-level Action Plan to overcome water-logging. The villagers decided to use the government's Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) for this purpose. The Act provides for paid employment to villagers for constructing infrastructure, among other things, to improve village-level incomes. In 2009, over 480 villagers dug a 1.4 km long, 10 feet wide and 7 feet deep canal in 11 days for the standing waters to exit. The total cost was over Rs 52,000, including voluntary labour contributed by 23 villagers. This collaborative effort at the Panchayat level has restored agricultural land belonging to 250 families in the Panchayat, provided agriculture-related employment to up to 4000 villagers and freed the villagers from the threat of water-borne diseases.

SWARNA SAB-1: Flood-resilient paddy variety

SWARNA means gold in chaste Hindi. SWARNA SAB- 1 is a water tolerant paddy variety proving to be no less than virtual gold for 207 farming households in block Jangal Kauria. Swarna variety of paddy is developed by Indian Rice Research Institute (IRRI) and is sown on 69 hectares of submerged paddy field. The crop successfully grows in water-logged farmlands to yield good harvest to small and large farmers. Swarna has definite attributes to build resilience of farming households who have been pushed to migrate and adapt to alternative survival skills due to climate change.

SESSION 6

Role of Panchayat Women Leaders in Making Village Development Plans and Accessing Government Schemes for Climate Change Adaptation and Food Security

1 Hour 15 Min

METHODOLOGY

- **Participants are asked to list their role in Panchayats**
- **Building on the agriculture schemes understood in Session 4, participants are asked to list schemes which they, as elected representatives, can promote for climate change adaptation and food security.**
- **Panchayat Raj Institutions representative then talks on the topic.**
- **This is followed by a discussion with notes takes by the facilitator and by participants.**

EXPLANATION AND INFORMATION

Presentation by Ms. Seema Singh
Panchayati Raj Department, Government of Bihar, Patna. Website: http://biharpanchayat.gov.in

The many forms of gender-based discrimination between men and women include differences in the way they are to behave, the education they can get, the food they eat, their roles in society and so on. Since these gender differences are determined by society, there is an urgent need to take a look at, and understand these differences, in the economic, social, cultural and political spheres of society.

In our patriarchal society, control over resources and benefits from them are for men; carrying the workload and making sure everything is managed properly is women's work. This is true within the home, with the family, on the field, with regard to live-stock, money and so on.

Women face many barriers and challenges in the political arena right from the beginning and when they try to discharge their roles. Some of the main challenges include illiteracy, lack of information and lack of awareness; the insecure and unsafe political environment; and lack of support from the family and relatives. Women need economic, social, religious and political support to help bring them centrestage, or to 'mainstream' them into society. Women will get their rightful space and entitlements in national plans and programmes only when they have an equal say in policy making and within decision-making organizations.

Politically it is important in a democracy for women and men to play equal roles. There are several reasons why this is needed:

- Half of the gram sabha (assembly of villagers) are women. Their concerns, ideas, work and decisions are equally necessary for village development.
- Many of the village activities are undertaken by women. So they will be better at knowing problems associated with these activities and how best to overcome them. Any decision taken by the gram sabha must, therefore, include the women's perspective. Women are best equipped to understand their own needs and priorities and to advocate on their issues. This alone will ensure that policy interventions translate into real empowerment of women.
- Undoubtedly, the contribution of women to their families and towards earning livelihood is as important as that of men. Both women and men must have an equal power to take decisions regarding the various aspects of their lives and livelihoods.
- Where women govern as equal partners with men, they can ensure equal distribution of limited resources to both genders.
- One of the necessary requirements of good governance is equal participation of all sections of society at all stages of policy making and decision-making. Here, non-participation of women opposes the very meaning of good governance.

OTHER RELEVANT INFORMATION FOR PANCHAYATS

Backward Region Grant Fund (BRGF)

These funds are used for maintaining regional harmony amongst the recognised backward region, wherein resources are created for effective implementation and completion of the on-going programs (schemes).

In order to makes these funds available the Panchayats can take note of the following:

- Appointment of qualified trainers- who can create awareness amongst the *Panchayat* leaders on issues pertaining to; agriculture, water management, livestock, crop management along with agri-marketing/business
- Appointment of one community based gender minister or volunteer- who can conduct programs on equal rights for (both men and women), women literacy campaign along with micro lending programs.
- Appoint of trained local engineers- who can repair and maintain the electricity, hand pumps, agri- pump set within the *Panchayats.*
- Through this scheme small scale business such as handicrafts, handloom and rural business hubs can be established within the first two years.

Rashtriya Gram Swaraj Yojana (R.G.S.Y)

This is a centrally sponsored scheme wherein the Ministry of Panchayati Raj can allot funds to Panchayat Raj Institutions who haven't received the B.R.G.F grants. These funds are used for providing training assistance to the centrally or state appointed district representatives. It also facilitates Panchayat leaders to become effective village representatives by laying out their roles/ responsibility.

District Rural Development Agency (D.R.D.A)

This agency plays a key role in incorporating governance, coherence, direction, and co-ordination in all their district rural development schemes/programs.

The main functions are:

1. District's rural development programs or/and poverty alleviation programs need to be incorporated through the PRIs for effective progress.
2. To implement programs within the rural development board in an integrated manner as well as managing the allocated central and state government finances.
3. To pass on the various governments' sponsored benefits to S.C/S.T/Women/Handicapped people.
4. D.R.D.A should provide timely progress report to the PRIs, Central and State government.

Source: http://pri-resources.in/MaterialUpload/CDLG/PanchayatiRaj.pdf

SESSION 7

Putting Learning into Practice: Building an Action Plan Gender, Climate Change Adaptation, Agriculture and Food Security — 1 Hour

METHODOLOGY

- **Facilitator introduces the exercise for group work.**
- **Each group, of about 5 people each, will list actions they can take as Panchayat leaders in accessing government programmes and schemes and other resources to tackle agricultural problems caused due to climate change.**
- **Each group is to list between 2-4 points of action, detailing the process that they will follow for implementing the action plan.**
- **Each group must also indicate how this intervention can be integrated into Village Development Plans as the 'Local Action Plan on Adaptation (LAPAs).'**

EXPLANATION AND INFORMATION

Panchayats are mandated to make Village Development Plans. This exercise will work on a few components of what may be called 'Local Action Plans on Adaptation' which can be integrated with the Village Development Plans. The focus of these LAPAs will be on gender, climate change adaptation, agriculture and food security and how government programmes and schemes can be benefited from for this purpose.

An indicative set of actions that may be shown/discussed with the participants include:

- Building village/panchayat-level grain banks, fodder banks, seed banks
- Roof rainwater harvesting structures in the name of women
- Using Mahatma Gandhi Rural Employment Guarantee Act (MNREGA) to build micro watersheds on farmlands belonging to women-headed households
- Promoting poultry
- Promoting vermicomposting and mixed farming using organic/low chemical inputs to revitalize soil fertility in the farmland and in the kitchen garden
- Etc.

DAY 2

SESSION 1

Recap of Day 1 — 30 Min

METHODOLOGY

- Ask for 10 volunteers to come to the centre of the room. Each of them contributes one point of what was discussed or what they learnt on Day 1
- Repeat this 3-5 times depending on the number of participants. In each round, participants must not repeat what has been said earlier.
- Contributions end with a 2-3 minute plenary for participants to add any point that may have been missed.

DAY 2

SESSION 2

Feedback and Wrap-up — 1 Hour

METHODOLOGY

- Paste on the wall 3 flip chart sheets separately in 3 different parts of the room.
- On one write the heading - What did you like?; on 2nd write – What did you not like?; and on 3rd sheet give the heading – Your Suggestions.
- Make one literate woman responsible for each of the sheets.
- Participants go around the room to fill the sheets. They can pick up pens and write themselves or take the help of the coordinator.
- At the end, each coordinator reads out her chart.
- This does not require any discussion but some response from the facilitator(s) should be given.
- For the wrap-up, the facilitator can present highlights of the training content and the future action strategy.
- Facilitator then thanks the participants for their time and effort and wishes them the best in their new ways of working.