



## POLICY DIALOGUE WORKSHOP ON FLOOD INDEX INSURANCE AND DROUGHT MANAGEMENT FOR AGRICULTURAL DEVELOPMENT IN BIHAR



Hosted by International Water Management Institute (IWMI) and Indian Council for Agricultural Research (ICAR-Patna)

Patna, India | 07 June 2017



RESEARCH PROGRAM ON  
Climate Change,  
Agriculture and  
Food Security



RESEARCH  
PROGRAM ON  
Water, Land and  
Ecosystems

**MAFF**  
Ministry of Agriculture,  
Forestry and Fisheries  
農林水産省

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## 1. Project Background

Global efforts are underway to reduce the risk posed by extreme weather events by increasing the resilience and coping capacity of vulnerable population and vital economic assets. Although national governmental organizations are better placed with the mandate to undertake measures to reduce the risk posed by extreme events, they lack reliable tools / methods which are robust to withstand the uncertainty posed by the climate change. The scenario in large developing economies like India are further complicated by the need to sustain economic growth, protecting the large section of agrarian population while maintaining environmental status quo in exploiting natural resources like land and water. Growing concerns are increasingly evident about the negative impacts of climate change on agriculture. Adaptation to the changes happening in rapid timeframe affecting millions of people becomes increasingly urgent and important. Climate change is deepening the risks already faced by the poor and vulnerable people in rural areas in developing countries who are involved in agriculture and allied climate-sensitive sectors for their livelihoods. Owing to the geographical placement of Bihar, (in particular North Bihar) located along the path of steep Himalayan rivers, it is prone to recurrent flooding imparting widespread damages. While significant flood defense like embankment construction, river training etc. were built over the years in many of the high-risk rivers, extreme events continue to cause widespread damages to life and property. The rural population who are completely dependent on agriculture for the livelihood were placed in perilous position from flood damages. Like floods, drought is also a recurring phenomenon in Bihar. The area of north Bihar (north to river Ganga) is of mainly flood prone while south Bihar (south of river Ganga) is under the influence of drought. Analysis shows that in recent years, not only the frequency of occurrence of these disasters has increased but most of the districts in north Bihar have also faced recurrent spells of drought with many districts facing floods and droughts simultaneously in different parts of the same district.

Agricultural insurance is considered to be an effective risk transfer mechanism to address moderate risk posed by extreme events such as floods, droughts, hailstorm, etc. The penetration of agricultural insurance scheme across developing countries varies widely. India currently implements one of the largest crop insurance coverage in the world subsidized by the government covering large number of smallholder farmers across the country (*Pradhan Mantri Fasal Bima Yojana* -PMFBY). The magnitude, scale and complexity involved in implementing PMFBY poses varied challenges in successful implementation of the crop insurance schemes. However, the crux of problem in traditional crop insurance scheme lies in high cost of verifying losses post occurrence of flood/disaster events in large numbers of small landholdings. Traditional schemes on loss-based insurance are not viable for remote rural smallholders completely disconnected from the mainland. In this context, advances in satellite technology and data analysis can help avoid the pitfalls of high transaction costs and therefore expand the potential reach of insurance policies to rural areas previously considered uninsurable.

International Water Management Institute (IWMI) with the support from CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) and Water, Land and Ecosystems (WLE) and Ministry of Agriculture, Forestry and Fisheries (MAFF, Japan), developed an innovative financial risk transfer solution called Index Based Flood Insurance (IBFI) particularly suitable for implementing in countries with large small holding farming communities against flood losses. IBFI scheme is currently being piloted in two countries, India and Bangladesh

to increase the short term coping capacity of small holding farmers against flood risk. Two hundred farmers are enrolled for this pilot program in villages around Muzzafarpur district in India. This innovative approach aims to streamline and fasten effective insurance payouts, so that the money reaches affected farmers in timely manner. The project integrated advanced numerical modelling techniques for constructing long-term flood patterns, high-resolution remote sensing data and statistical models to predetermine flood thresholds, which could trigger speedy compensation payouts. Effective end-to-end solutions are being developed in collaboration with a range of organizations and experts from central and state government bodies, private insurance firms, community-based organizations (CBOs) and nongovernmental organizations (NGOs). The second part of the workshop will focus on the IWMI's Drought Monitor and its application in agriculture drought management complementing the works of ICAR institutes in drought management and contingency planning.

ICAR, IWMI and Govt. of Bihar mainly the Disaster Management Department along with Cooperative Department, jointly organized the workshop.

## 2. Objective and Scope of the Workshop

The overall objective of the workshop was to briefly present the IBFI project progress till date and discuss policy issues which can complement overall disaster risk reduction activities.

- *Present the results of IBFI product development and product evaluation in Bihar, India • Discuss strategies for implementation in 2017 monsoon season.*
- *What are the other key challenges in the utilization of these technologies?*
- *Evolve mechanism of linking spatial drought information with drought management planning on near real time basis at sub-district level and district level.*
- *Focus on the need for spatially distributed integrated drought mitigation plans including both supply, augmentation and demand management interventions as improved preparedness to drought proofing*
- *Develop and recommend protocol for drought monitoring and mitigation with inbuilt contingency measures including capacity development*
- *What steps need to be taken in the coming years to make sure that responses to climate change are risk informed and that we are better prepared for flood risk financing and drought proofing?*

### Participants

IBFI project partners invited relevant stakeholders from wide range of organizations and disciplines in India. Participants from key agencies include Department of Disaster Management – Government of Bihar, Bihar State Disaster Management Authority (BSDMA), IIWM, CRIDA, representatives from insurance agencies such as AIC, Bajaj Allianz, ICIC Lombard, farmer representatives and local NGOs.

### 3. Project presentation and discussions

#### 3.1 Opening session

Welcoming participants and honorable chief guests from Government of Bihar, *Dr. Alok Sikka* highlighted the scale of flood risk faced by North Bihar and need for innovative tools such as IBFI to address the recurrent problem. Drawing from his long experience and association during his time in ICAR-Patna, he mentioned the continuous hardships faced by the people in North Bihar from floods and in South Bihar due to water scarcity. Dr. Hossain reiterated the impact of recurrent flood events causing huge agricultural damage and thereby economic losses, which impacts the rural economy to large extent. He emphasized that innovative disaster risk transfer solutions such as IBFI are the need of the hour to improve our responses to extremes influenced by climate change. He further stressed on the importance of using remote sensing images, which can aid disaster management agencies and projects like IBFI alike. Technical challenges faced during the project were highlighted to emphasize the need for various organizations to collaborate and leverage their key expertise. Dr Amarnath Giriraj, project leader welcomed and thanked the chief guests and participants. He gave a brief overview of the workshop to the chief guests and informed them that this is the first such comprehensive pilot of innovative IBFI scheme in India as well as South Asia.

*Mr. Anil Kumar Sinha, IAS (retired) and ex-Vice Chairman, BSDMA* said that given that Bihar - crisscrossed by large number of rivers including the Ganga has been synonymous with floods in history. Some districts in Bihar experienced floods and droughts simultaneously in the same year. Bihar is an agricultural state where 73 % of people depend on it for their livelihoods. Recent decades have witnessed increase in occurrence of various disasters. Hitherto,, the response to disasters has been mainly reactive in approach. Subsequently, with the global UN campaigns starting with IDNDR followed by Hyogo Framework for Action as an outcome of 2<sup>nd</sup> World Conference on Disaster Risk Reduction and passing of Disaster Management Act in 2005 by Parliament, the government has adopted a pre-disaster pro-active planned approach to deal with all phases of disasters. With the setting up of Bihar State Disaster Management Authority and its operationalization in 2010, Government of Bihar announced that 1<sup>st</sup> week of June (1-7 June) every year being celebrated as Flood Safety Week. The co-operatives and SHGs at panchayat levels form an integral part of PMFBY in overall implementation. He emphasized the need to expand IBFI project to other districts in Bihar after the pilot in collaboration with government departments, since 28 out of the 38 districts are flood prone – 15 highly flood prone and 13 flood prone.

*Shri Alok Kumar Mehta, Minister of Co-operatives, Govt. of Bihar* welcomed the initiative by IWMI and ICAR to pilot IBFI in Bihar. Giving his perspective from administration point of view, he stressed that for a project like IBFI to be successful, integration of different organisations and various arms of state and central governments needs to come together to help in disaster mitigation and management. His department being responsible for allocating financial outlay to agricultural insurance schemes, he will be interested to know from the pilot, how IBFI model is going to attract the suffered communities and how much IBFI will be helpful for those communities.

Prof. Chandrashekhar, Minister for Disaster Management, Government of Bihar, recommended the project team to pilot and implement the IBFI soon, so as to draw lesson and upscale to other



districts in Bihar. Even though there is below normal rainfall in Bihar due to the effect of global warming, the Tarai region of Bihar is vulnerable and experiences flood events. In the year 2016, 88 lakh people were affected by floods in two phases, one due to heavy rainfall in Nepal affecting North Bihar districts, and second due to release of water from dams of Jharkhand affecting Southern Bihar. He wishes that the participants utilize the expertise of IWMI and discuss the matter together to give a meaningful way of implementing the IBFI that supports not only the farmers but also helps the Govt. to mitigate the disaster situation.

The vote of thanks was given by Dr. B P Bhatt, Director of ICAR RCER center, Patna. He thanked the chief guests, who gave valuable government policy perspectives for how pilot schemes such as IBFI and drought management will be useful for them in the long run. Thanking the participants for recognizing the importance of this workshop, he gave credit to IWMI and ICAR colleagues for successful organization of the policy dialogue workshop where experts from different background could brainstorm in a common platform to chalk out implementation strategies.

### 3.2 Workshop Context, Purpose and Overview by Dr Giriraj Amarnath, Research Group leader, IWMI

Dr. Giriraj started the presentation describing the overall context of IBFI project in India. He highlighted the IWMI's efforts to develop risk transfer tools to address agricultural flood risk in South Asia as the main motivation behind the project. The main difference between traditional indemnity based insurance and index based insurance schemes were described. A brief description on the methodology tested to select pilot areas in India was presented to the participants. Various methodological steps in creating an IBFI product were described in brief along with the project timeline. Effect of micro-climatic factors involved in deciding the spatial variations in crop yield patterns was discussed. Investing before disaster strikes has to be used as one of the mainstream disaster risk reduction mechanism by the government agencies and IBFI is one such case where investment in risk insurance by the government will disperse flood losses across wide range of insurance players. The IBFI product created by Swiss Re based on the flood data shared by IWMI for Muzzafarpur district pilot area was described to the participants. The insurance product was field tested in pilot areas in India and has undergone multiple iterations and transformation for effectively representing flood losses. Willing to Pay survey and business model results were briefly discussed. Role of advanced remote sensing technologies in aiding IBFI implementation in particular and for whole range of disaster management were briefly discussed.

He mentioned that the IBFI product is at the stage where it is ready for pilot and emphasized the need for participation of government organizations, insurance companies and NGOs in implementation to pilot test the product and assess its effectiveness in addressing the short term financial need of farmers post flood losses. He further described the focused efforts from IWMI in developing a sustainable business model for IBFI to make it an integral solution to agricultural flood risk problems. He concluded emphasizing the major role Bihar government needs to play to pilot new risk transfer approaches like current IBFI pilot to improve, customize and integrate it as part of overall risk management strategy for operational use. Implementation plan for 2017 monsoon season was presented to the participants explaining how IWMI is closely collaborating with Swiss Re and other insurance companies to file the product with Insurance Regulatory Development Authority (IRDA) to get it ready for implementation during the current year.

### 3.3 Panel Discussion “Policy dialogue on flood risk financing, guidelines and implementation in scaling up flood insurance”

Shri. Anil Sinha, ex-Vice Chairman, BSDMA moderated the session. Dr. Rathore, Ex-director of IMD reiterated the advantages of using remote sensing images for monitoring floods and droughts but emphasized the need for ground truthing data collection in order to validate the remote sensing results. He stressed the need to integrate the data from river gauge with flood depth in inundated flood plains to overcome the lack of data challenges faced by numerous government agencies. More challenging is to assess the impact of various depth and duration on crop losses. Same amount of water will have different impacts on different crops. Now reliability of short-term weather forecast (5to7 days) has improved to significant extent and it has to be effectively used for decision making for disaster management. Mr. Sunil Choudhary, CPSL Bihar stressed the need for involvement of wide range of stakeholders during the planning stages of any interventions rather than directly implementing a decision/product with no links to stakeholders. Role of Digital technologies and information such as remote sensing for crop loss assessment can reduce the ambiguity in manual measurements spread across large spatial scale.

Mr. Shubhendu Dutta, AIC briefly discussed about the history of different agricultural insurance schemes in India including NAIS, MNAIS, weather based insurance schemes and PMFBY. The premium paid as part of PMFBY by the farmer is very low and for uptake of IBFI by the farmers, it is imperative that premium doesn't exceed what is currently paid by the farmers. Since PMFBY covers large number of crop losses, while IBFI primarily focuses on flood. Farmer's perception plays a significant role in success of any new insurance product including IBFI. Briefly discussed the way in which PMFBY is currently implemented includes the process of recording the crop cutting experiments. Awareness raising among the farmers is very important to let them know the advantages and limitations of specific products like IBFI. Coverage of loanee as well as non-loanee farmers will increase the reach of IBFI. There has been high number of insurance claims come across by the insurance companies in Bihar indicating significant reach and awareness of agricultural insurance.

Mr. Satish Raju, Swiss Re briefly discussed about the development of IBFI product for both India and Bangladesh including pricing. He gave an example of successful implementation of a mobile-based payout for a drought project in Kenya. Getting the right stakeholders and government support for the weather based insurance is very important for the implementation of IBFI.

Dr. S.K. Ambastha from IIWM conveyed the need for community based cropping and relief by government in yearly flood prone area, since it is not economical for the insurance companies to do pay-out every year. As the flood risk faced by the farmers is of moderate range, agencies should target product like IBFI where it will be more successful. Index based on which pay-out takes place can be changed to include operational cost so as to make it cost-effective for the insurance companies to pilot the project.

Mr. Rajan Sinha from GP Sinha Centre for Disaster Management discussed in detail about the crisis management (SDRF, NDRF) and explained where risk management/ risk transfer through insurance will be most helpful. He emphasized the need for flood hazard model to capture dynamics exhibited by the weather behavior.

Mr. Sanjeev Kumar, Panchayat member and a farmer himself, highlighted why farmers are wary of insurance plans. Due to both the occurrence of drought and flood, farmers are not depositing premiums as they are not sure which event will occur and whether they'll get the pay-outs or not. Lots of difficulties faced by the farmers to get pay-outs. High-income farmers tend to favor crop insurance while low income and non-loanee farmers prefer to avoid insurance schemes.

### 3.4 Drought Monitoring and Management for Agriculture Development

Dr. Mishra from ICAR-Patna presented activities by ICAR in drought management in Bihar. He discussed the agro-climatic zones of Bihar, flood risk in North Bihar, Drought risk in South Bihar. It is estimated that 23 % of rice area in Bihar is drought prone. Since 1985, there appears to be shift in occurrence/delay of monsoon season based on long term weather data. Most of the rainfall occurred in the month of July while recent decades witnessed the shift to August. So there exists greater chance for occurrence for droughts due to the changes in occurrence of monsoon rainfall in Bihar. ICAR research activities indicate that, in drought-prone ecology linseed and sunflower have shown quite a good yield. In addition to the different crop varieties, drip irrigation was combined to increase water productivity. He also discussed variety of drought management activities by ICAR such as Low Energy Water Application (LEWA), Swarna Shreya - one of the drought tolerant rice variety developed by ICAR-RCER, creating water storage structure, polythene mulching to store the soil moisture, crop diversification in rainfed upland area (soyabean, pulses), millets are one of the drought tolerant crops, bed planting technology (saves 40% of water), laser levelling technology, etc.

Dr. Giriraj from IWMI presented South Asia Drought Monitoring System (SADMS). SADMS will act as vital source of information for impact assessment and drought management by the government and development agencies. SADMS is based on multiple remote sensing based indices characterizing drought situation. Now IWMI is in process of collaborating with various agencies across South Asia for validating the Integrated Drought Severity Index (IDSI). IDSI is a hybrid index, which characterizes agricultural drought. SADMS in conjunction with early warning system can help preparedness and monitoring of drought situation across large spatial scale. IDSI helps in understanding drought frequency, duration and its recovery at block/district to national level owing to its spatial resolution of 500m. The challenges are to relate technical drought information with associated impact on socio-economic scenario due to lack of datasets.

Dr. K.V. Rao from CRIDA presented District Drought management contingency plans prepared for Government of India. He briefly described the impacts of rainfall distribution on crop production. Institutional setup to undertake such a complex task for large number of districts in India was presented. Contingency plans for early season drought, mid-season drought and terminal drought were briefly discussed. Major crop systems within districts are covered for contingency plans. Depending on the dominant factors, district specific contingency measures, management activities, crop varieties, modulus of implementation by the district level officers are some of the key aspects addressed in this study. In case of delay in monsoon, what measures need to be taken such as prescribing specific crop varieties, crop types, stock of seeds, etc. Measures that need to be taken in case of supplementary irrigation such as preparedness in water storage structures were discussed. The whole plan consists of preparedness document, real time interventions through



meetings during crop/monsoon season and decide what plans need to be implemented to suggest which crops can be grown. Preparedness meeting enables the district administration to keep or arrange for necessary varieties of seeds in case of forecasted drought. Seamless flow of information for successful implementation was discussed. Concluding the session, Dr. Rathore gave example of farmers uptake of contingency plans. After the presentations, the workshop was opened to the participants to convey their views on project activities, key challenges expected in the implementation phase and any other suggestion.

### 3.5 Panel Discussion “Drought Monitoring, Assessment and Forecasting in India and explore broader application in drought preparedness and mitigation measures”

Final session of the workshop concentrated on broader application for drought monitoring and forecasting for operational applications. Dr. Giriraj mentioned that while there exists adequate capacity at national level through agencies like CRIDA monitoring crop growth and drought condition, information is limited at district level. While stressing that large amount of data is available with different agencies, data relevant for different scales from district to national is often a major challenge. Even in cases of existing data, its reliability comes under question. There is urgent need to integrate data available in government organizations with other remote sensing datasets to derive quantifiable and usable information on drought. Linkages between meteorological and hydrological drought leading to agricultural drought was briefly discussed.

Dr. R N Sahoo from IARI briefly mentioned about the Government of India drought policy in 2008 or 2009. Considering the geographical extent and varied bio-physical settings encountered in India, location specific early warning is a major challenge. NIDM provides quarterly drought information to all the states. The drought situation in different situations was decided based upon the threshold for declaration. He stressed the need for government, private sector, research agencies and NGOs to collaborate to make the initiatives like IBFI and SADMS more reliable. Dr. PSB Anand from IIWM informed the participants that the rainfed agricultural areas in India decreased from 64 % a decade back to 51.8 % by the recent estimate. There is a need to identify and prioritize the drought-affected areas on block level similar to what is being done at district level by the contingency plans. Information of water availability at block level will enhance the sharing mechanism whereby water deficit block can be supplied from water surplus block. So real time monitoring and data sharing forms an integral part of drought preparedness and Management plans.

## 4. Workshop outcomes

Following are the key recommendation for future follow up with various stakeholders:

- The workshop concluded by agreeing that consistent efforts are needed to ensure government active participation in developing policy formulation including IBFI in district disaster management plans (DDMPs) to promote increasing financial resilience which can indirectly reduce damages by encouraging investments in risk reduction prior to a disaster

through provision of risk information and/or through premium discounts for hazard mitigation.

- Two cabinet ministers of the Govt. of Bihar along with Joint Secretary from DMD and many others had participated in the event and had expressly committed their support.
- A coherent site specific policy needs to developed to integrate existing data and information from multitude of sources consisting of drought contingency plans, drought forecasting system, SADMS to provide actionable data to district level decision makers.
- In addition, for the implementation phase of IBFI, sustained campaign and awareness raising initiatives should go hand in hand with other pilot activities for the farmers to grasp the nature of project.
- During the forthcoming monsoon season, in addition to piloting the project, efforts will be focused on awareness campaign in collaboration with local partners to disseminate the workings of agricultural insurance scheme among the selected pilot villages.

## ANNEX 1: WORKSHOP AGENDA



### Policy Dialogue Workshop on Flood Index Insurance and Drought Management for Agricultural Development in Bihar

#### ICAR Research Complex for Eastern Region (ICAR-RCER)

**June 7 2017, Patna, Bihar (India)**

##### **Background**

Climate variability already poses a significant threat to humanity, with the poor and most vulnerable at greatest risk. It is expected that such section of society will become more exposed to climate shocks as a result of climate change. South Asia, and India in particular, is at high risk. India's economy is closely linked to its natural resource base with over 700 million people in the country dependent on climate-sensitive livelihood sectors such as agriculture, water, and forestry that are further threatened by the impact of climate change (GoI 2008). These threats, however, will not be felt uniformly. Renewable freshwater already varies considerably across the country. With the growing hydro-climatic variability, much of India is expected to receive a larger volume of its precipitation during extreme rainfall events, such as in western and peninsular India, while other areas will experience fewer wet days, more dry days, and a heightened frequency of extreme events. Numerous options are emerging that are promising from an overall water resources perspective and provide greater resilience for those exposed to increasing climate-related risks.

In this context, jointly with the Government of Bihar, International Water Management Institute (IWMI) and ICAR RCER are organizing one day workshop to discuss risk management solutions that promote better resilience among small and marginal farmers and vulnerable communities in promoting the advances in satellite technology and modeling tools through innovative risk transfer solutions involving insurance and drought monitoring to support preparedness as well as contingency plans for agricultural drought management. The holistic approach of managing floods and drought will allow developing comprehensive flood and drought mitigation plans and disseminate information rapidly that can enable water resources and disaster managers, communities and farmers to better manage risks related to climate variability and its impact on agriculture and food security.

The four-year project had its inception workshop in Patna on 1st August 2015 with the goal to contribute to sustainable approaches to index-based flood insurance that can help smallholders better manage their flood risk. The project's objective is to develop agricultural flood insurance products using remote sensing data and flood modelling tools that can accurately depict yield loss, map extent of flood damages in smallholder farming due to weather and/or other perils, and be scalable in insurance schemes delivered at micro and meso levels. The project has developed meso-

level IBFI scheme using flood hazard model and remote sensing data – to pre-determine flood thresholds that trigger speedy compensation pay out. The project is working with various stakeholders such as NDMO, DDM, BSDMA, Ministry of Water Resources and Agriculture and insurance industry to develop reliable and affordable product that are scalable and sustainable. Other project components includes IBFI Business Models, IBFI Economic Analysis, Index Insurance and Gender Equity, Rising Awareness through Media network and social network. This project, apart from being the first such attempt at a large-scale in the two countries, is also a trendsetter for catastrophe insurance in natural disaster prone developing world. The set up and social network is further advanced in India and are in the final stage of implementation.

The first half day of the workshop is to briefly present the project progress until date and set up a policy dialogue platform in Bihar/India to inform and exchange experience about the potentials of an index-based flood insurance with relevant high-level policy- makers. Further, the workshop will briefly discuss with Department of Disaster Management, GoB and Ministry of Agriculture (New Delhi) to experiment the IBFI product for the 2017 monsoon season. The second part of the workshop will focus on the IWMI's Drought Monitor and its application in agriculture drought management in together with the works of ICAR institutes in drought management and contingency planning.

The main purpose of the workshop is to:

- *Present the results of IBFI product development and product evaluation in Bihar, India • Discuss strategies for implementation in 2017 monsoon season.*
- *What are the other key challenges in the utilization of these technologies?*
- *Evolve mechanism of linking spatial drought information with drought management planning on near real time basis at sub-district level and district level.*
- *Focus on the need for spatially distributed integrated drought mitigation plans including both supply, augmentation and demand management interventions as improved preparedness to drought proofing*
- *Develop and recommend protocol for drought monitoring and mitigation with inbuilt contingency measures including capacity development*
- *What steps need to be taken in the coming years to make sure that responses to climate change are riskinformed and that we are better prepared for flood risk financing and drought proofing?*

## **Tentative Program Outline**

Time	Program	Resource Persons
08:30 – 09:30	Registration	Pooja Pandey & ICAR RCER
<b>Session 1: Inauguration ceremony</b> <b>Facilitator: Nitasha Nair, IWMI New Delhi</b>		
09:00 – 10:15	Welcome Remarks	Alok Sikka, IWMI Delhi
	Workshop Introduction	Giriraj Amarnath, IWMI HQ
	Opening Remarks	Shri Anil Sinha, Sr. Advisor & Mentor Hazard Risk Management and Climate Change Adaptation
	Remarks from DDM	Sri Pratyaya Amrit, I.A.S., Principal Secretary
	Remarks from BSDMA	Shri Vyas ji, Vice Chairman
	Remarks from Cooperative Dept.	Sri A L Meena, I.A.S., Principal Secretary
	Remarks from MoA,FW	Ashish Kumar Bhutani, JS, MoA (TBC)
	Inaugural Address by Chief Guest	Prof. Chandrashekhar, Hon’ble Minister for Disaster Management , Government of Bihar
	Vote of thanks	Dr. B P Bhatt, Director, ICAR RCER
10:15 – 10:45	Group photos and Tea Break	
<b>Session 2: Update on Project Results</b> Moderators: P. Amrit & S K Ambast Rapporteur: Avinandan, IWMI		
10:45 – 11:15	Project Overview, results and IBFI product	Giriraj Amarnath, IWMI HQ Mangesh Patankar, SwissRe
11:15 – 12:00	IBFI Implementation plan for 2017	TBD
15mins Q&A		
<b>Session 3: Panel Discussion “Policy dialogue on flood risk financing, guidelines and implementation in scaling up flood insurance”</b> Duration: 12:00 – 13:00 Panelist: TBD (Government, Insurance Industry, MFI’s and NGOs) Moderators: Anil Sinha & Vyas Ji Rapporteur: Karthikeyan, IWMI		
<i>Insurance can play a critical role in the disaster risk financing and management of the flood risks. Insurance can take various forms to meet the differing needs of different segments of society. This session will explore the various types of public private partnerships that have been formed to overcome some of the challenges to providing financial protection for significant risks and/or to various segments of the economy.</i> <ul style="list-style-type: none"><li><i>What are the different approaches that can be taken to providing disaster insurance to different stakeholders?</i></li><li><i>What is the role of government in each of these areas?</i></li><li><i>How can governments prioritize sector(s) where intervention may be most needed?</i></li><li><i>What preconditions are necessary for the development of a flood insurance market?</i></li><li><i>What can be done to improve smallholder farmers understanding of the risks that they face?</i></li><li><i>What can be done to support the establishment of an insurance culture in countries with limited experience with insurance?</i></li><li><i>What contribution can an insurance regulator make to building trust in insurance companies’ capacity to meet their obligations?</i></li></ul>		
13:00- 14:00	Lunch	



Session 4: Drought Monitoring and Management for Agriculture Development		
Moderators: B P Bhat & Director, Agri, Bihar		Rapporteur:
14:00 – 14:30	Experience of SADMS Drought Monitor and its application	Giriraj Amarnath, IWMI HQ
14:30 – 14:45	Presentation on Drought Management and contingency plans	K V Rao, CRIDA, Hyderabad
14:45 – 15:00	Presentation from Department of Agriculture and DoM, Patna	TBD
15:00 – 15:15	Mainstreaming Climate Resilience into District level Planning for Drought Proofing in Bihar	Alok Sikka, IWMI & ICAR RCER
15:15- 15:30	Tea break	
<b>Session 5: Panel Discussion “Drought Monitoring, Assessment and Forecasting in India and explore broader application in drought preparedness and mitigation measures”</b> Duration: 15:30 – 16:30 Panelist: LS Rathore, KV Rao, IMD, DoA Patna Moderator: Alok Sikka, IWMI		
Rapporteur: Nitasha, IWMI		
<i>This session will discuss on the current and existing drought monitoring and management plans to identify areas of medium to long-term drought risk reduction measures. Further, discuss on the coordination among stakeholders for information sharing among Meteorology, Agriculture, Water Resources &amp; Irrigation and Socio-economic institutions for drought preparedness and risk management. Selected topics but not limited to the discussion are outlined below.</i> <ul style="list-style-type: none"><li>• <i>What are the current procedures/challenges on Early warning systems?</i></li><li>• <i>What mechanisms are in place for communicating and liaising drought monitoring and early warning information between national institutions?</i></li><li>• <i>Discuss the initiatives that are required to integrate the future drought response and recovery in drought plan?</i></li><li>• <i>Finally need to develop both medium- and long-term measures and specify the responsible agency(ies) for each measures.</i></li></ul>		
16:30- 17:00	Closing remarks and way forward	
19:00 – 21:00	Workshop Dinner (Location TBD) , Patna	