WORLD BANK GROUP
Agriculture

INDONESIA

"Agro-Food Policy and Institutional Reform" (P165966)

Pillar 3: Knowledge Transfer for Capacity Building on Agriculture Risk Management
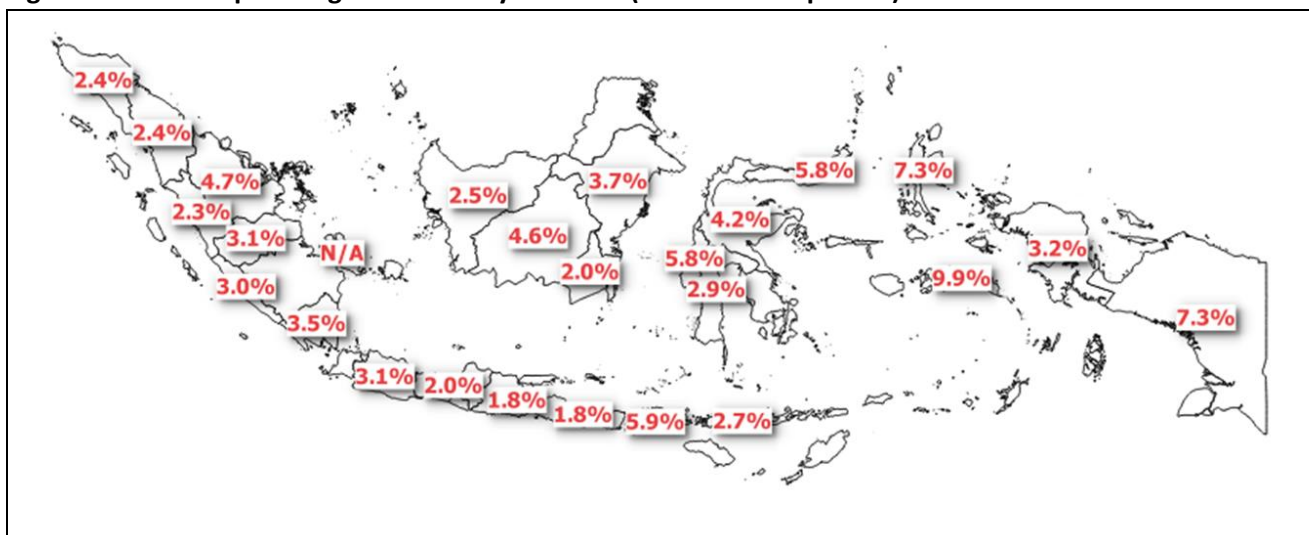
ACTIVITY SUMARY NOTE

A. Summary

This activity summary note corresponds to Pillar 3: "Knowledge Transfer for Capacity Building on Agriculture Risk Management", a sub-activity under the broader Technical Assistance "Agro-Food Policy and Institutional Reform" (P165966), with an objective to assist the Government of Indonesia in making better-informed decisions regarding selected agro-food policy, institutional and spending reforms. This sub-activity was implemented during May-November 2018 with a principal aim to strengthen local capacity to undertake analytical, feasibility and program development work in the area of agricultural risk assessment.

B. Context/Background

For an island nation such as Indonesia, with a population of more than 260 million people, nearly 45 percent of whom live in rural areas and who depend on the country's agriculture sector for food and jobs, the benefits of more robust management of agricultural risks and associated volatility are multi-fold. Based on some preliminary analysis of historical production data, Indonesia loses on average an estimated US$904 million a year on food crops from risk-induced shocks (based on a food crops loss analysis (including rice, cassava, peanut, maize, soybean and sweet potato) during 1980-2016. This represents around 2.6 per cent of the gross value of food crops; with losses as high as 7.6 per cent linked to the most extreme events. Provinces situated in Jawa and Sumatera Islands with the Average Loss Cost (ALC) lower than 3% are less risky than provinces in Kalimantan, Sulawesi, Papua and Maluku Islands where ALCs are much higher (see Figure 1). The potential impact of risk on food crops is compounded by the complexities of transport and logistics in many provinces.

Figure 1 - Food Crop Average Loss Cost by Province (as % of the Exposure)

Blunting adverse shocks to agriculture production boosts productivity. Curbing production volatility protects rural jobs and livelihoods. Diversifying production systems and improving stewardship of natural resources (e.g., soil, water, forests, rangelands) nurtures biodiversity. Empowering women to manage risk strengthens household welfare and food and nutrition security. Most importantly, by reigning in uncertainty, effective agricultural risk management creates a more predictable environment for investments and sustained rural sector growth.

Agricultural risk management (ARM) is identified by the GoI as a key strategy in efforts to increase productivity, strengthen food security, reduce poverty, and safeguard rural livelihoods. It is crucial to boosting prosperity among the rural poor. It is fundamental to a future in which productive, sustainable and healthy food systems are able to support a population expected to concentrate in/around urban areas as the country continues its rapid industrialization. It is critical to delivering improved food security, nutrition, and health outcomes for its rapidly growing population.

Agricultural risk management is a primary GoI policy priority. The Law on Farmers' Protection and Empowerment (2013) aims to secure farmers' welfare by improving access to land, finance, and markets, providing protection against agricultural risk, and strengthening farmers' organizations. The challenge remains how to implement a comprehensive strategy to protect farmers against agricultural risk in the context of having over 68 per cent of farming units classified as smallholder farmers with average sizes of around less than two hectares. Moreover, in 2012 about 65 million people hovered around the national poverty line and were highly vulnerable to food price increases, health shocks and natural disasters.[1] Tackling this challenge requires strengthening local capacity in developing strategies for curbing agricultural risk.

Governments and agricultural stakeholders need to have an evidence-based assessment of the agricultural risks and their importance in terms of severity and frequency of occurrence, their costs in terms of financial losses and fiscal impacts, and of the capacity to manage risk by various stakeholders. Having an agreed assessment of risks empowers farmers, communities, and government agencies in making more optimal decisions to minimize the negative impacts of risks and taking advantage of investment opportunities.

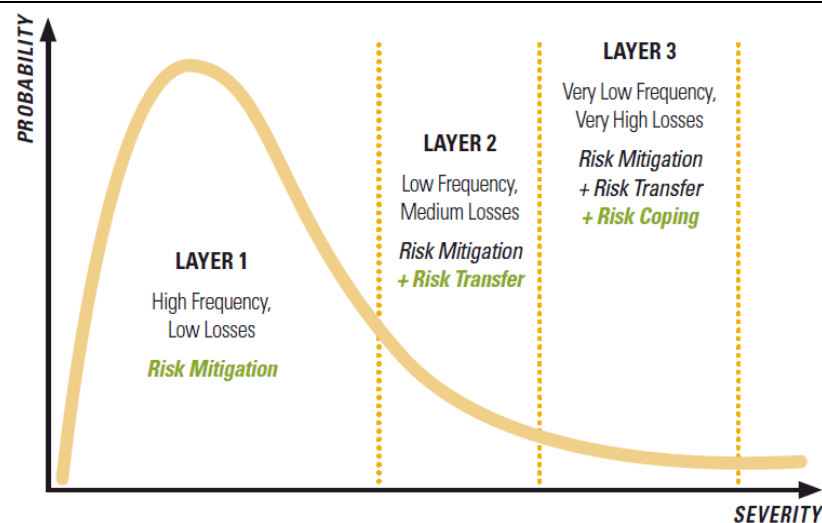## C. Managing agricultural risk: a holistic approach

The World Bank has developed a methodology to assess, prioritize and manage agricultural risks through a holistic approach and to aid integration into national investment plans and strategies.[2] Over the last decade, the World Bank has supported the introduction of systematic risk assessments in partner countries across Africa, Asia and Latin America, taking into account a wide variety of risks and relying on various sources, to obtain a clear picture of the priority risks affecting the entire agriculture sector (or in specific regions) and the country's capacity to manage risk. The key is identifying priorities and developing an evidence-based and long-term action plan for managing sector risk that will guide investments, policy choices, and institutional reforms across the sector. The prioritized risks can be addressed by using a basket of strategies to mitigate, transfer, and/or cope with risk. An illustration of the conceptual framework of such strategies can be seen in the following graph.

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[1] World Bank (2014). Development Policy Review. Indonesia: Avoiding the trap.
[2] World Bank (2015). Agriculture Risk Management. Methodological Guidelines for Development Practitioners.

Figure 2 – Conceptual Framework for ARM

This layering approach illustrates that **Risk Mitigation** strategies need to be adopted and implemented to strengthen farmers' resilience to be able to retain risk for low severity- high frequency risk events. Whereas layer 2 is the typical **Risk Transfer** window for options of transferring risk (e.g., insurance, hedging) for the residual risk (for low frequency and medium losses) that cannot be retained by the farmer. However, for the very high losses – low frequency events that can cause catastrophic impacts (i.e. severe El Niño events) **Risk Coping** strategies are needed, particularly ex-ante preparedness by the government to secure contingent financing to assist rural communities to cope with risk. By undertaking comprehensive risk assessments for the main commodity supply chains and by adopting a holistic approach to identifying and prioritizing risk, governments are better equipped to start managing the main drivers of agricultural volatility and food insecurity.

D.   Methodology/Approach

As part of the World Bank Agro-Food Policy and Institutional Reform (P165966) TA to Indonesia, the World Bank implemented the current sub-activity with an objective to strengthen via knowledge transfer and training local capacity to undertake analytical, feasibility and program development work in the area of agricultural risk assessment.

During 30 April-4 May 2018, the World Bank mobilized a scoping mission to Jakarta and Bogor, Indonesia to meet with government, academic and other stakeholders to get a better understanding of risk dynamics affecting Indonesia's agricultural sector and existing knowledge and capacity gaps for improved risk management. A key objective of the mission was to identify a local partner that could benefit from the proposed knowledge exchange activity and that could become the primary change agent through which ARM methodology could be institutionalized, further adapted to the Indonesian context, and disseminated. The mission highlighted a number of challenges and bottlenecks to the mainstreaming of more targeted, holistic risk management strategies into sector policy programming and planning. Key challenges and bottlenecks related primarily to:

* limited awareness and capacity on agricultural risk management.

- insufficient knowledge transfer between stakeholders (public-private partnerships), and low take-up of innovation persist in the area of agricultural risk mitigation.

- risks still assessed based on perceptions or that are solutions-oriented. There is a lack of a standardized methodology to provide evidence-based risk assessments and prioritization.

- Though ensuring more productive and resilient agriculture is a GOI priority, ARM is not an integral part of national policies and planning, nor is it integrated into agricultural services and programs.

- a lack of a holistic, integrated approach. Most tools and initiatives provide stand-alone solutions for mitigating agricultural risks. For a sustainable ARM, tools and solutions need to be embedded in an integrated risk management approach that optimally combines mitigation, transfer and coping strategies.

Within the above context, Pillar 3 activities were designed to facilitate the transfer of knowledge on conceptual and practical analytical approaches to Agricultural Risk Assessment and Management via:1) training of academic faculty at Bogor Agricultural University (IPB) in ARM methodology; and 2) the integration of the World Bank's ARM knowledge base and experience into IPB's cirriculum. As one of the premier academic institutions for agricultural training and research in Indonesia, IPB is well-positioned to leverage and disseminate knowledge and understanding of ARM through its education and professional training programs and to lead research that will inform evidence-based agricultural policy development and decision making in the short-, medium- and long-term.

The focus of the approach was to enhance IPB's training and research methodologies with the World Bank's methodology and experience in advising developing economies in agricultural risk management over the past decade and more, and in piloting and applying diverse set of ARM strategies in various countries. The transfer of capacity and skills focused on integrating methodological approaches and materials into existing curricula and training the teaching staff in the Agribusiness Department via the delivery of training modules and workshops to highlight core conceptual approaches, methodologies and tools, best practices, and lessons learned.

Specifically, the knowledge transfer and capacity-building activities included:

(i) Adapting training materials that were developed by the Bank team and collaborators to conduct a Training of Trainers (ToT) of the IPB Agribusiness Risk academic team (see training agenda in Annex).

(ii) Supporting IPB to adopt/adapt the training materials and incorporate them into their curriculum for university and executive training. In addition to the broader approaches and methodologies, the training incorporated specific weather (index-based insurance) and price risk (i.e. coffee, cocoa) management tools.

(iii) A case study on the chilies supply chain was carried out with the risk management teaching team in Cianjur district, West Java province, to give hands-on experience in the Bank's approaches and methodology, and more specifically, on data collection and triangulation of information with supply chain stakeholders.

(iv) Transfer of pertinent documentation of key analytical and conceptual publications, including on approaches, methodologies, specific applications and tools, and study cases.

The activities together aimed to drive sustainable institutional and behavioural change beyond the conventional training approach and, where possible, to use the capacity potential of local knowledge

institutions such as Bogor University with aim to institutionalize and facilitate the mainstreaming over the medium- to long-term of ARM knowledge and practices.

E. Summary of Outputs

The primary outputs of this knowledge transfer and capacity-building activity are outlined below:

1. Training of trainers (TOT) on ARM methodology for Bogor University
During August 14-16, 2018, a training of trainers was held at IPB's Dramaga campus. Eleven members of the University's academic faculty participated, all of whom (except one from the Statistics Department) were from the Agribusiness Department academic staff. Overall, the training was well received by the participants, who expressed strong interest and appreciation for the qualitative assessment, vulnerability analysis and climate risk aspects of the World Bank's methodology, which were not covered within the Agribusiness Risk graduate and undergraduate syllabi. The participants also appreciated the anecdotal evidence and examples from various risk assessments conducted by the World Bank that were used to illustrate the training concepts. They requested that World Bank case studies be integrated into the syllabus to illustrate existing theoretical concepts. Furthermore, they asked that the qualitative assessment, vulnerability analysis, climatic and weather risk analysis also be integrated into the syllabus.

2. Strengthening ARM curriculum for Bogor University
This activity benefited from strong collaboration between the Agribusiness Risk teaching team and the World Bank. The existing syllabus was expanded to include concepts such as conducting qualitative assessments and vulnerability analysis, and climate risks. Additionally, case studies from the Bank's global ARM experience were added to illustrate the existing as well as the new topics covered under the revised draft syllabus. A copy of the Syllabus can be found in Annex.

3. Supply Chain Risks Assessment fieldwork
A field assessment of risks within the Chilies Supply Chain was conducted to enrich the syllabus with a specific case study example from Indonesia. The chilies case study was conducted in Cianjur district, West Java province by a team composed of Agribusiness Risk faculty members and a World Bank consultant. The study found that wind storms, floods and excessive rainfall, counterparty risk, price volatility and drought were the main risks facing the supply chain. While the case study was not validated by stakeholders, it is anticipated that the team's experience conducting the case study shall provide local examples of the Bank's methodology for both the undergraduate and graduate courses.

F. Proposed Follow-up Activity

Training other stakeholders
As a next step, and as a continuation of the above capacity building effort, IPB staff that participated in the above ToT could conduct a workshop to train relevant staff of GOI agencies, most likely convened by the Ministry of Agriculture. This follow up training will provide IPB with an opportunity to engage GOI agencies and introduce the new training materials and approach. The Ministry of Agriculture is also interested to incorporate ARM training into its syllabus and calendar of extension refresher courses for province and district staff. This represents a real opportunity for the World Bank and IPB to continue to collaborate on furthering training support to the Agricultural Ministry and other relevant agencies.

G. Challenges and Recommendations

During the implementation of the activity, several challenges hampered the team's progress. These challenges, the lessons learned, and recommendations for future teams undertaking similar knowledge transfer and capacity-building work include:

1. *Language barriers* – Initial consultations with IPB faculty indicated that training participants had an advanced level of English. However, it was noted early on during the training that some of the participants had only a limited to moderate working level of English. These participants in some cases struggled with some of the more technical and conceptual concepts, but with a slower pace and translation help into Bahasa from colleagues, they were eventually able to understand the material.

   Recommendation: Teams should plan ahead to dedicate sufficient resources to translating the training materials into the local language prior to the training, which should be done for future trainings given the technical complexities of ARM concepts, etc. In addition, teams should include at least one native speaker who is ideally technically well versed and who can help facilitate efficient communication and information exchange. In the future, other concepts and analytical tools of a higher complexity such as weather index insurance and commodity price risk management could be introduced and incorporated into the training materials and curriculum once there is sufficient understanding of and local competency of the basic ARM methodology.

2. *Training timing and location* – The timing and location of the training caused avoidable disruptions. The training coincided with the end of the summer holiday break and the startup of the new academic year. To save costs, the team decided to organize the training at Bogor University. During the training workshops, some of the staff were given ad hoc assignments, which affected their ability to participate during the entire training program. Although, the TOT was conducted just before the start of the academic year, ad hoc departmental activities affected attendance. Also, the Department plans its calendar of activities 6 months in advance, and activities that are not on the Department's calendar are considered to be ad hoc, and thus, of secondary importance.

   Recommendation: Future trainings should ideally be planned well in advance and held during the summer holiday when faculty members typically have fewer commitments and more flexible schedules. Also, trainings should ideally be organized off-site, away from campus, preferably in another city/district/province so to avoid competing time and workload commitments.

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Agriculture Sector Risk Assessment Training of Trainers

August 14-16, 2018
IPB, Bogor
Indonesia

TUESDAY, 14 AUGUST 2018

09:00-09:15	Introduction: IPB Representative
09:15-09:45	**Session I: Conceptual Framework and Operational Approach**
09:45-10:15	Discussion
10:15-10:45	**Session II: Understanding the Context and Background Research**
10:45-11:15	Discussion
11:15-11:45	**Session III: Understanding Vulnerability**
11:45 – 12:15	Discussion
12:15 – 13:15	Lunch
13:15 – 13:45	**Session IV: Incorporating Climate Change**
13:45 – 14:15	Discussion
14:15 – 14:45	**Session V: Data Analysis – Methods for Measurement**
14:45 – 15:15	Discussion
15:15 – 16:00	Day 1 Wrap Up

09:00 – 09:30	Summary of Learning from Day 1
09:30 – 11:30	**Session VI: Quantification - By the Numbers (Part 1)** Group exercise
11:30 – 12:00	Group presentations and discussion
12:00 – 13:00	Lunch
13:00 – 13:30	**Session VII: Quantification - By the Numbers (Part 2)**
13:30-14:00	Discussion
14:00 – 15:30	**Session VIII: Field Assessment** Group exercise
15:30 – 16:00	Group presentations and discussion
16:00 – 16:30	Day 2 Wrap Up

THURSDAY, 16 AUGUST 2018

09:00 – 09:30	Summary of Learning from Day 2
09:30 – 10:00	**Session XI: Qualitative assessment: Beyond the Numbers**
10:00-10:30	Discussion
10:30 – 11:00	**Session X: Prioritizing Risk**
11:00-11:30	Discussion
11:30 – 13:00	**Session XI: Risk Management Solutions** Group exercise
13:00 – 14:00	Lunch
14:00 – 14:30	Group presentations and discussion
14:30 – 15:00	**Session XII: Operationalizing Integrated Risk Management - Road to Resilience**
15:00-15:30	Discussion
15:30 – 16:00	**Training Wrap Up and Evaluation**

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Agriculture Sector Risk Assessment Training of Trainers
Participant List

August 14-16, 2018
IPB, Bogor
Indonesia

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COURSE	AGRIBUSINESS RISK MANAGEMENT	CODE	AGB 621	CREDIT	3(3-0)	SEMESTER	?

DIVISION	Business and Entrepreneurship	COURSE COORDINATOR	Dr Anna Fariyanti

TEACHING TEAM	1. Dr Anna Fariyanti 2. Dr Netti Tinaprilla 3. Dr Suharno	REQUIREMENT	1. TBD 2. TBD

COURSE DESCRIPTION	This subject delivers the theoretical concepts of agricultural risk such as agribusiness and risk, measuring of risk, utility theory related to risk, risk preference, modelling of agribusiness risk, types and kind of agricultural risk (output, price, policy program), production optimization under risk, decision making under risk, risk under Game Theory, decision maker responses on risk related issues (information, financial structure management, participating in government program, hedging and future trading, business and portfolio diversification, leasing, partnership, new technology adoption). Additionally, the course gives the students practical applications of the theoretical concepts with real world examples from the World Bank's agricultural sector and supply chain risk assessment case studies. At the end of the course, students shall be expected to practically apply the acquired skills in a risk assessment of a farm or agribusiness or supply chain of their choosing.
LEARNING OUTCOME	After studying this course, the student should be able to: 1. Explain the concept and the scope/ issues coverage of agribusiness risk 2. Identify type and kind of risks in agriculture and agro-processing 3. Using quantitative as well as qualitative tool of analysis, interpret the results of analysis and to apply it in business and public policy decision making 4. Assess the capacity of the supply chain/agriculture sector actors to manage the identified risks 5. Prioritize the risks 6. Understand, to analyse and to apply risk management especially in agribusiness decision making

Signature of Course Coordinator	Head of Division	Head of Department

Date		Version	0

WK	LEARNING OUTCOME	COURSE CONTENT	INDICATORS	TEACHING METHOD	ASSESSMENT CRITERIA	CASE STUDY &/ REFERENCE
1	Student able to define and describe key terms, concepts and theories of risk	a. Concept of risk b. Concept of uncertainty c. Probability, expectancy, variance, standard of deviation, variance coefficient d. Types and sources of risk e. Risk transmission f. Risk management framework g. Other key terms and concepts	Student able to: a. Define agricultural risk b. Differentiate between risk and constraints c. Describe different types and sources of agribusiness d. Define probability, expectancy, variance, standard of deviation, variance coefficient	a. Lecture b. Reading assignment	a. Exercise in True and False form or Multiple choice and essay	a. World Bank, 2016. Pg. xi-12 b. Jaffee, Siegel and Andrews, 2008a. Pg. 9-27
2-3	Student able to: a. Describe, analyse and interpret the single and portfolio risk b. Quantify losses due to production and price risks for a single or multiple commodities	a. Single/specialized risk measurement: b. Concept of portfolio risk c. portfolio risk measurement d. Quantifying production losses e. Assessing price volatility	Student able to: a. Choose the right approach in assessing the risk, either it is single or portfolio b. Calculate both of single and portfolio risk c. Quantify production risk d. Quantify price risk	a. Lecture b. Group Discussion c. Brain storming d. Problem assignment	a. Paper assignment b. Problem assignment c. Group discussion 2.	a. World Bank, 2016. Pg. 23-31 b. Jaffee, Siegel and Andrews, 2008a. Pg 26-27 c. Braimoh et al., 2018. Pg. 15-37. d. Anon. Pg.1-16
4-5	Student able to: a. Describe the individual behavior in handling the risk	a. Utility theory b. Income-risk relationship c. Individual behaviour through the risk (risk averse, risk taker, risk neutral)	Student able to: a. Differentiate individual behaviour in handling the risk b. Calculate the degree of risk aversion	a. Lecture b. Group Discussion c. Course materials reading assignment	a. Paper assignment	a. World Bank, 2016. Pg. 45-50, 33-35 b. Jaffee, Siegel and Andrews, 2008a. Pg. 16-20

WK	LEARNING OUTCOME	COURSE CONTENT	INDICATORS	TEACHING METHOD	ASSESSMENT CRITERIA	CASE STUDY &/ REFERENCE
	b. Assess the individual degree of risk aversion c. Describe and assess risk preference d. Define vulnerability and apply vulnerability assessment results in policy design e. Carry out field and qualitative assessment	d. Degree of risk aversion e. Assessment method of degree of risk aversion f. Individual response to income changes g. Definition of vulnerability in the agricultural context h. Vulnerability assessment tools i. Synthesis and illustration of vulnerability assessment j. Application of vulnerability assessment to risk assessment and policy design k. Application and incorporation of qualitative assessment results into risk assessment	c. Describe and explain individual degree of risk aversion d. Define vulnerability in the context of risk management e. Apply the vulnerability assessment in policy design f. Use qualitative methodologies to add value to risk assessment			c. Jaffee, Siegel and Andrews, 2008a. Pg 79-83 d. WFP, 2015 e. Clarke and Hill, 2013 f. Choudhary and D'Alessandro, 2015. Pg. 37-42 g. The World Bank Group, 2015
6-7	Student able to: a. Describe the risk analysis model b. Describe and explain decision theory in uncertainty c. Assess the farm income in uncertainty	a. Model in risk analysis b. Just and Pope model c. ARCH-GARCH model d. Decision theory in uncertainty (payoff matrix e. Decision Trees, Maximax, maximin, bayes /laplace, hurwicz, programming	Student able to: a. Describe the risk analysis model, interpret the model and when to use the model b. Apply the right approach in making decision in uncertainty situation	a. Lecture b. Group Discussion c. Brain storming d. Problem assignment	a. Paper assignment b. Problem assignment c. Group discussion	a. World Bank, 2016. Pg. 105-107 b. Braimoh et al., 2018 Pg. 53-68. c. Jaffee, Siegel and Andrews, 2008b. Pg 84-86

WK	LEARNING OUTCOME	COURSE CONTENT	INDICATORS	TEACHING METHOD	ASSESSMENT CRITERIA	CASE STUDY &/ REFERENCE
	d. Use prioritisation filters, determine probability of event and severity of its impact, assess the relative importance of commodity risk, and develop prioritisation matrix. e. Explain and demonstrate game theory	f. Risk prioritisation filters g. Risk prioritisation analytical tools h. Game theory	c. Calculate the income changes probability in uncertainty d. Develop and use risk prioritisation filters, and illustrate with analytical tools e. Make a decision base on game theory			
8	Student able to: a. Understand linkages between climate change impacts and agricultural weather risk b. Incorporate climate change considerations into the risk management framework c. Describe and explain different types of bank risk and strategy to manage it	a. Climate change in context of agricultural risk management b. Types of risk bank c. Bank risk management strategy d. Probability assessment e. Assessing risk impact with VaR	Student able to: a. Differentiate between weather and climate b. Align weather risk solutions to climate change solutions c. Differentiate between the various types of bank risk d. Pick the right strategy in managing the bank risk	a. Lecture b. Group Discussion c. Course material read assignment	a. Paper assignment	a. World Bank, 2016. Pg. 4-6, 83-90 b. Braimoh et al., 2018 Pg. 21-25. c. Mulenga and Wineman, 2014

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WK	LEARNING OUTCOME	COURSE CONTENT	INDICATORS	TEACHING METHOD	ASSESSMENT CRITERIA	CASE STUDY &/ REFERENCE
9	Student able to: a. Depict the risk resources and develop strategy in risk management b. understand, identify, and filter risk management solutions c. identify the risk management strategy	a. Mapping the risk resources and develop strategy to handle the risk b. Risk management strategies c. Filtering risk management solutions d. Solutions assessments e. Risk management strategy and action plan f. Diversification strategy g. Vertical integration strategy h. Production contract i. Marketing contract j. Hedging k. Insurance	Student able to: a. Identify risk probabilities and its impacts b. depict the source of risk c. formulate the strategy to manage the risk d. Identify risk management strategies e. Filter and apply the best risk management strategies to the identified risks f. Develop an appropriate risk management strategy and action plan	a. Lecture b. Group Discussion c. Brain storming d. Problem assignment	b. Paper assignment c. Problem assignment d. Group discussion	a. World Bank, 2016. Pg. 51-57 b. Jaffee, Siegel and Andrews, 2008a. Pg. 37-41
10-14	a. Student able to: describe and depict the risk management in the real life	a. Risk management in action (case study) b. Operational considerations for risk management action plans c. Entry points for mainstreaming risk management d. Guiding principles for monitoring and evaluation	Students able to: a. Prepare a risk assessment proposal b. Present and defend proposal c. Carry out field assessment d. Write a risk assessment report	a. Practical (field) assignment	a. Risk assessment proposal presentation b. Risk assessment report	

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