Title: Scaling up Climate-Smart Agriculture (CSA) Practices and Technologies Across South Asia

1. Description

Start date	End date	Management liaison	Mgmt. liaison contact
Jan 2015	Dec 2016	RP SAs	Aggarwal, Pramod <P.K.Aggarwal@cgiar.org>

Funding source types	Status	Lead Organization	Project leader
W1/W2	Complete	IWMI - International Water Management Institute - Sri Lanka	Shirsath, Paresh B <p.bhaskar@cgiar.org>

Project is working on

Flaship(s)
F1 (before F4 - Philip): Priorities and Policies for CSA
F2 (before F1 - Andy): Climate-Smart Technologies and Practices
F3 (Lini): Low emissions development
F4 (before F2 - James): Climate services and safety nets

Region(s)
SAs: South Asia

Project summary

This project primarily integrates evidences of CSA, institutional and financial assessments and stakeholders' feedbacks to develop scaling up and scaling out plans for CSA. These plans setup adaptation pathways of CSA/CSV including capacity building programme, institutional and financial mechanisms, and potential costs and benefits of the programme implementation. This project will supplement SA regional program in terms of models, data and tools relating to all four flagships and will also support continuation of few selected past initiatives relating to crop yield monitoring, prioritization of CSA, development of agricultural NAPs/SAPs and improvement of triggers for weather based crop insurance schemes. This project will also involve in horizontal scaling out of adaptation options as well as vertical scaling up through integration in to current adaptation policies and plans across the region. CCAFS South Asia team will strategically engage with various stakeholders by organizing workshops, trainings and other meetings.

2. Partners

Partner #1 (Leader)

Institution: IWMI - International Water Management Institute

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Project Leader	Shirsath, Paresh B <p.bhaskar@cgiar.org>	Activity 2014-307 *Leader*. Activity 2014-308 *Leader*.	HQ
Partner	Aggarwal, Pramod <P.K.Aggarwal@cgiar.org>	Activity 2014-309 *Leader*. Activity 2014-311 *Leader*.	HQ

Partner #2

Institution: WFP - World Food Programme

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Kanel, Damoder <damodar.kanel@wfp.org>	Activity 2014-307 *Partner*.	Kathmandu, Nepal

Partner #3

Institution: Natural Resources Management Center-Sri Lanka

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Kadupitiya, H.K. <nrmcdoa@ltnet.lk>	Activity 2014-307 *Partner*.	HQ

Partner #4

Institution: CEGIS - Center for Environmental and Geographic Information Services

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Khan, Malik Fida A. <mkhan@cegisbd.com>	Activity 2014-308 *Partner*.	HQ

Partner #5

Institution: eeMausam Weather Risk Management Services Private LTD-India

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Rao Gattineni, Srinivasa <rao.gs@eemausam.com>	Activity 2014-309 *Partner*.	HQ

Partner #6

Institution: ICAR - Indian Council of Agricultural Research

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Rao, Srinivasa <director@crida.in>	Activity 2014-309 *Partner*.	HQ

Partner #7

Institution: AIC - Agriculture Insurance Company of India Limited

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Plappallil, Joseph J. <pjjoseph@aicofindia.com>	Activity 2014-309 *Partner*.	HQ

Partner #8

Institution: CIMMYT - Centro Internacional de Mejoramiento de Maíz y Trigo

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Aggarwal, Pramod <P.K.Aggarwal@cgiar.org>	Project design, implementation and M&E	HQ

Partner #9

Institution: BAIF Development Research Foundation-India

Contact(s):

Type	Contact	Responsibilities and contributions	Branch
Partner	Sohani, Girish <bbsohani@baif.org>	Contribute to project activities	HQ

Lessons regarding your partnerships and possible implications for the coming planning cycle:

Year	Lesson(s)
2016	The partnerships like with WFP need to be strengthened and nurtured further.

Partnerships overall over the last reporting period:

Our partnerships played a key role in the project implementation; some partners like WFP outperformed the expectations. There was some under performance regarding the development NAP, however it has been sorted out and final NAP document is prepared. The reason for under performance of partner in development of NAP was highly multidisciplinary nature of the work and communications remained largely virtual because of travel restrictions.

3. Locations

This project is not global

Project level	Latitude	Longitude	Name
Country			India
Country			Nepal
Country			Bangladesh
Country			Sri Lanka

IWMI-F1 (before F4 - Philip)-F2 (before F1 - Andy)-F3 (Lini)-F4 (before F2 - James)-SAs-P119 - Research Project
subproject on 2017-02-19 at 13:02 (Reporting cycle 2016)

RESEARCH PROGRAM ON
Climate Change,
Agriculture and
Food Security

CGIAR   CCAFS

4. Outcomes

4.1 Project Outcomes

Project Outcome statement:
This project will result in three National Adaptation Plans and State Action Plans at sub-national level for India. Improved weather thresholds will be developed for millions of farmers. Agencies responsible for food security planning and monitoring will start using CCAFS science and tools for increased adaptive capacity to climatic risks.

Annual progress towards outcome (end of 2016*): Development of decision support system for food security planning under climate change and use in at least 1 national/sub-national level

Annual progress towards project outcome in the current reporting cycle (2016*): The case studies for prioritization using CSAP toolkit in Bihar is done and published in the special issue of Agricultural Systems. The agricultural NAP for Bangladesh has been developed using CSAP toolkit, stakeholder's consultations and expert judgments. For the NAP, the identification of suitable technology has been followed by an analysis of the possible implementation mechanism including the institutional framework, the financing mechanism and the research needs and knowledge management for the future. This action plan comprises of 9 programmes with 42 clustered AEZ specific actions for short, medium and long term with indicative costs and their respective implementation agencies. Nepal Food Security Monitoring System (NeKSAP) continues to use the CCAFS Regional Agriculture Forecasting Toolbox (CRAFT) for food security monitoring. Earlier results showed that there is the potential for crop yield modelling to be incorporated in the crop yield estimation process in Nepal and can thus make a significant contribution to food security planning and early warning. The CRAFT outlook was published as Advance Estimates through the Food Security Bulletins and Crop Situation Updates under the NeKSAP. To mainstream the existing usage of CCAFS tools for in-season crop yield forecasting in Nepal, nine capacity building workshops were arranged. In these workshops, about 200 participants including government officials, research scientists and agriculture graduates were trained to use CRAFT. This will ensure continued usage of CRAFT in operational mode in Nepal. Agricultural insurance in India has been shifting its paradigm from weather index to yield index with village as insurance unit. This brought new challenges in effective implementation; CCAFS is working on evaluation and testing of technology usage to assist the loss assessment at village scale. Several technologies like satellite RS, UAVs, digital photographs and hand-held sensors are being evaluated.

How communication and engagement activities have contributed to achieving your Project outcomes:* In all the activities communications and engagement played vital role, CCAFS-SA team is continuously engaged with stakeholders (Government, insurance industry, researchers and farmers) through various platforms e.g. the agricultural NAP for Bangladesh was basically a multi-stakeholder activity. The stakeholders were engaged from the inception of the project. The participation in workshops and meetings organized by government agencies and insurance industry ensured continued engagement and possible realignment of research objectives in view of stakeholders' need. CCAFS is regularly engaged with planners, researchers and partners for highlighting CCAFS research activities, brain-storming new ideas and lastly for out-scaling of CCAFS science outputs.

Evidence documents of progress towards outcomes:*

https://marlo.cgiar.org/data/ccafs/projects//119/projectOutcome/P119-ProgressTowardsOutcomes.pdf

Annual progress towards outcome (end of 2015): Development of three national/sub-national levels CSA adaptation plans. Improved thresholds of WBCIS for major crops.

Annual progress towards outcome (end of 2017): Need further planning

Annual progress towards outcome (end of 2018):

lessons regarding your Theory of Change and implications for the coming planning cycle; e.g. how have your assumptions changed, or do you have stronger evidence for them:* Our assumptions on agricultural insurance in the region have changed since the new insurance scheme in India has undergone a paradigm shift from WBCIS to yield index at village scale. This necessitated realignment of our research priorities.

4.2 CCAFS Outcomes

RP SAs Outcome 2019: Boundary partners are developing better business models for public-private partnerships for climate informed agriculture risk management at different scales

Indicator #1: Number of regional, national, and/or sub-national initiatives incorporating research outputs to develop or improve major demand-driven, equitable, climate informed services that support rural communities

2019
Target value: 0
Cumulative target to date: 1
Target narrative: Develop two national/sub-national initiatives for crop yields monitoring and supplement flagship projects in disseminating climate and agro-advisory services through ICT, implementing crop insurance program and food stock planning.
The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2015
Target value: 0
Cumulative target to date: 0
Target narrative: No target
The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2016
Target value: 1
Cumulative target to date: 1
Target achieved: 1.0
Target narrative: Develop one national/sub-national initiatives for managing agricultural risks through CCAFS research outputs on yield monitoring, ICT services, crop insurance and food stock planning.
Narrative for your achieved targets, including evidence: CCAFS Regional Agricultural Forecasting toolbox is being used continuously by the Government of Nepal for in-season rice and wheat yield monitoring. The CRAFT inputs are vital to crop outlook assessment and overall food security situation update in Nepal. The CRAFT data-sets (soil, cultivar, irrigation etc.) were updated and now more high resolution data-sets are being used. Besides Nepal meteorological data-sets the satellite precipitation data-sets (CHIRPS) were used in crop yield monitoring. To strengthen the institutional capacities to use CRAFT nine training sessions including one national training were conducted by CCAFS and WFP.
Narrative for your achieved annual gender and social inclusion contribution to this CCAFS outcome: Not applicable to this project
The expected annual gender and social inclusion contribution to this CCAFS outcome: At least 40% of beneficiaries would be women and youth

Major Output groups:

● F4 (before F2 - James): New climate information and analysis that enhances the capacity of data providers (e.g. regional and national meteorological institutions) to meet the demands of climate service beneficiaries

● F4 (before F2 - James): Weather related Insurance products are designed, tested, and brought to scale with implementing partners

● F4 (before F2 - James): Decision support systems improved or developed for incorporation into national food security safety net programs

RP SAs Outcome 2019: National and sub-national governments develop climate-smart agriculture policies and strengthen related institutions based on evidences from case studies, data, tools, and models

Indicator #1: # of equitable national/subnational food system policies enacted that take into consideration climate smart practices and strategies

2019
Target value: 0
Cumulative target to date: 1
Target narrative: Supplement regional and flagship projects in developing at least two national/sub-national level governments initiatives using national/state adaptation plans for climate smart interventions.
The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2015
Target value: 0
Cumulative target to date: 0
Target narrative: No target
The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2016
Target value: 1
Cumulative target to date: 1
Target achieved: 1.0
Target narrative: Supplement regional and flagship projects in developing at least one national/sub-national level governments initiatives using national/state adaptation plans for climate smart interventions.
Narrative for your achieved targets, including evidence: The case studies for prioritization for Bihar is done and published in the special issue of Agricultural Systems. Research article on theoretical framework and trade-off analysis using CSAP has been revised; it will be submitted to Agricultural Systems. The CSAP toolkit was also used in process of development of the agricultural NAP for Bangladesh. The analytical rigour of CSAP with stakeholder's consultations and expert judgments provided vital inputs for robust planning . The developed action plan highlights 9 programmes with 42 clustered AEZ specific actions for short, medium and long term with indicative costs and their respective implementation agencies.
Narrative for your achieved annual gender and social inclusion contribution to this CCAFS outcome: Not applicable to this project
The expected annual gender and social inclusion contribution to this CCAFS outcome: At least 40% of beneficiaries would be women and youth

Major Output groups:

- F1 (before F4 - Philip): Priority setting contextualised with national stakeholders and capacity strengthened to apply outputs in policy formulation; including trade-off analyses, foresight activities, and quantification of regional socio-economic scenarios

RP SAs Outcome 2019: Governments, private sector and farmer organizations increase their investments and develop incentive mechanisms to promote wide scale adoption of improved climate-smart practices and technologies

Indicator #1: # of national and subnational development initiatives and public institutions that prioritize and inform project implementation of equitable best bet CSA options using CCAFS science and decision support tools

2019
Target value: 0
Cumulative target to date: 2
Target narrative: Supplement regional and flagship project in developing three national/sub-national initiatives using decision support tools for promotion and implementation of CSA.
The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2015
Target value: 0
Cumulative target to date: 0
Target narrative: no target
The expected annual gender and social inclusion contribution to this CCAFS outcome: <Not Defined>

2016
Target value: 2
Cumulative target to date: 2
Target achieved: 1.0
Target narrative: Supplement regional and flagship project in developing at least two national/sub-national initiatives using decision support tools for promotion and implementation of CSA.
Narrative for your achieved targets, including evidence: In collaboration with local partners in Bangladesh, CCAFS has developed a draft analytical report for informed decisions regarding CSA to support the development of the agricultural NAP for Bangladesh. In the agricultural NAP development process, the identification of suitable technology has been followed by an analysis of the possible implementation mechanism including the institutional framework, the financing mechanism and the research needs and knowledge management for the future. NAP identified AEZ specific actions in short, medium and long terms with indicative costs.
Narrative for your achieved annual gender and social inclusion contribution to this CCAFS outcome: The current proposal does not focus on gender issues
The expected annual gender and social inclusion contribution to this CCAFS outcome: At least 40% of beneficiaries would be women and youth

Major Output groups:

● F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

4.3 Other Contributions

Contribution to other CCAFS Impact Pathways:
<Not Defined>

Collaborating with other CRPs

<This project does not have a CRP selected yet.>

4.4 Case Studies

Case Study #111

Title: Scaling out climate smart agriculture through CSV approach

Year: 2016

Project(s): P119

Outcome Statement: Different CSV approaches have been designed, implemented and evaluated in collaboration with NARS, local partners and farmers groups including women, youth and marginal farmers. As the results, the Government of Nepal has started to scale out CSA through CSV approach, ITC Limited and USAID are investing to develop more than 2,000 CSVs in 6 states in India, and the State Government of Gujarat plan to invest on developing large number Solar Pump Irrigators' Cooperative Enterprise.

Research Outputs: 1. Prioritization, testing and evaluation of a range of CSA options in CSVs across South Asia (report attached) 2. CSV Brochure (attached) 3. Blogs (attached) 4. Journal papers (in pipeline)

Research Partners: Nepal: Ministry of Agricultural Development (MoAD), Department of Environment (DoE), National Planning Comission (NPC), Nepal Agriculture Research Council (NARC), LI-BIRD, Practical Action Consulting India: State Department of Agriculture, ICAR Bangladesh: Bangladesh Agricultural Research Institute (BARI), Bangladesh Agricultural University (BAU), Department of Fisheries (DoF), WorldFish

Activities: 1. Identification, prioritization, testing and evaluation of a range of CSA technologies, practices and services in collaboration with farmers and other key stakeholders in the CSVR4D and other sites 2. Continuous engagement and communication with local, state and national partners 3. Development and dissemination of various communication products such as brochure, blogs and workshop reports

Non-Research Partneres: District and Village Development offices in Nepal, ITC limited and USAID in India and farmers cooperatives and groups in all CSV locations

Output Users: Local, state and national agriculture development offices, private sector, service providers and rural and agricultural development agencies and NGOs.

Evidence Outcome: 1. Nepal government vows to implement Climate-Smart Village model as part of key policies for 2016-17 2. Gujarat's energy minister announced in a public meeting that they are issuing 20,000 new solar pumps on CCAFS-IWMI's model 3. Increasing Adaptive Capacity of Farmers to Climate Change thru Climate-Smart Villages in India

Output Used: Designing and implementation of different approaches of CSVs

References Case: 1. https://ccafs.cgiar.org/blog/nepal-government-vows-implement-climate-smart-village-model-part-key-policies-2016-17#.WKVpqjt95hE 2. Contract between CCAFS and ITC Limited (Attached) 3. Nepal Government's annual policy 2016-17 (attached)

Primary 2019 outcome indicator(s):

● # of national and subnational development initiatives and public institutions that prioritize and inform project implementation of equitable best bet CSA options using CCAFS science and decision support tools

● # of public-private actors at national and sub-national levels are using new incentive mechanisms or business models/ markets that explicitly promote climate smart approaches along the value chain, using CCAFS science

● Number of regional, national, and/or sub-national initiatives incorporating research outputs to develop or improve major demand-driven, equitable, climate informed services that support rural communities

● # millions of hectares targeted by research-informed initiatives for scaling up low-emissions agriculture and preventing deforestation

● # of equitable national/subnational food system policies enacted that take into consideration climate smart practices and strategies

Link between outcome story and and the FP Outcome(s): This regional work contribute FP outcome

Annex uploaded:

https://marlo.cgiar.org/data/ccafs/projects//61/caseStudy/Policies%20and%20Programme%20of%20the%20GoN%20FY%202016-17.pdf

5. Project outputs

5.1 Overview by MOGs

Major Output groups - 2019
F4 (before F2 - James): Decision support systems improved or developed for incorporation into national food security safety net programs **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F4 (before F2 - James): Weather related Insurance products are designed, tested, and brought to scale with implementing partners **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F1 (before F4 - Philip): Priority setting contextualised with national stakeholders and capacity strengthened to apply outputs in policy formulation; including trade-off analyses, foresight activities, and quantification of regional socio-economic scenarios **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>
F4 (before F2 - James): New climate information and analysis that enhances the capacity of data providers (e.g. regional and national meteorological institutions) to meet the demands of climate service beneficiaries **Brief bullet points of your expected annual 2019 contribution towards the selected MOG:** <Not Defined> **Brief`2019 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined>

Major Output groups - 2016
F4 (before F2 - James): Decision support systems improved or developed for incorporation into national food security safety net programs **Brief bullet points of your expected annual 2016 contribution towards the selected MOG:** NA **Brief summary of your actual 2016 contribution towards the selected MOG:** CCAFS tool (CRAFT) is being used continuously for yield monitoring in Nepal. Several improvements like use of satellite weather (CHIRPS), high resolution soil data-sets etc. have been done for the crop outlook assessment done at sub-national level. Capacity building of various stakeholders done through training on CRAFT. **Brief`2016 plan of the gender and social inclusion dimension of the expected annual output:** At least 40% of beneficiaries would be women and youth **Summary of the gender and social inclusion dimension of the 2016 outputs:** Not applicable to this project
F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2016 contribution towards the selected MOG:** Tools will support for adaptation planning based on biophysical, socio-economical and tradeoff analyses. **Brief summary of your actual 2016 contribution towards the selected MOG:** A climate smart agricultural prioritization case study for Bihar is also done using biophysical and socio-economic databases at regional level. The developed case study prioritizes technology portfolios under socio-climatic uncertainties through multi-objective trade-offs analysis. The trade-offs among food security, adaptation, mitigation and income were analysed. **Brief`2016 plan of the gender and social inclusion dimension of the expected annual output:** Gender and youth friendly CSA adaptation strategies will be developed **Summary of the gender and social inclusion dimension of the 2016 outputs:** Not applicable to this project

F4 (before F2 - James): Weather related Insurance products are designed, tested, and brought to scale with implementing partners

Brief bullet points of your expected annual 2016 contribution towards the selected MOG: Improved insurance triggers will be developed

Brief summary of your actual 2016 contribution towards the selected MOG: The agricultural insurance (weather index) products for Potato for Punjab & West Bengal in India were requested by State Bank of India as actuarial products. CCAFS-SA team designed the weather thresholds, however, they could not be used in the subsequent season because of the changes in policy on insurance.

Brief`2016 plan of the gender and social inclusion dimension of the expected annual output: Not applicable

Summary of the gender and social inclusion dimension of the 2016 outputs: Not applicable to this project

F1 (before F4 - Philip): Priority setting contextualised with national stakeholders and capacity strengthened to apply outputs in policy formulation; including trade-off analyses, foresight activities, and quantification of regional socio-economic scenarios

Brief bullet points of your expected annual 2016 contribution towards the selected MOG: Adaption plans at national or sub-national level will be developed

Brief summary of your actual 2016 contribution towards the selected MOG: An adaptation plan for agriculture in Bangladesh using CCAFS tools (CSAP) has been developed. This adaptation plan used analytics of CAP, stakeholders' consultation and expert assessment for chalking robust developmental road map under climatic uncertainties.

Brief`2016 plan of the gender and social inclusion dimension of the expected annual output: Inclusion of gender and youth issues in the adaption plans

Summary of the gender and social inclusion dimension of the 2016 outputs: Not applicable to this project

F4 (before F2 - James): New climate information and analysis that enhances the capacity of data providers (e.g. regional and national meteorological institutions) to meet the demands of climate service beneficiaries

Brief bullet points of your expected annual 2016 contribution towards the selected MOG: New ICT tools will be tested

Brief summary of your actual 2016 contribution towards the selected MOG: CCAFS is testing technology options for loss assessment in agricultural insurance at village scale. Several technologies like satellite remote sensing, UAVs, digital photographs and hand-held sensors are being evaluated. In addition to these technologies integrated assessment models are also being tested for agricultural insurance.

Brief`2016 plan of the gender and social inclusion dimension of the expected annual output: Gender friendly ICT based tools for dissemination of CSA technologies and services

Summary of the gender and social inclusion dimension of the 2016 outputs: Not applicable to this project

Major Output groups - 2015
F4 (before F2 - James): Decision support systems improved or developed for incorporation into national food security safety net programs **Brief bullet points of your expected annual 2015 contribution towards the selected MOG:** <Not Defined> **Brief summary of your actual 2015 contribution towards the selected MOG:** Our research reports on in-season crop yield forecast got good recognition by Nepal Food Security Monitoring System (NeKSAP). Department of Agriculture has use this product for produce seasonal crop outlooks. **Brief`2015 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined> **Summary of the gender and social inclusion dimension of the 2015 outputs:** Not applicable to this project.
F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA) **Brief bullet points of your expected annual 2015 contribution towards the selected MOG:** <Not Defined> **Brief summary of your actual 2015 contribution towards the selected MOG:** CSA prioritization was done for Bihar state in India and Bangladesh using CSAP toolkit, multi-objective trade-off analysis among food production, emission and income is also done for the purpose of adaptation planning. Large datasets were collected and analyzed to develop adaptation plans in agriculture. **Brief`2015 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined> **Summary of the gender and social inclusion dimension of the 2015 outputs:** Prioritization considers gender component.
F4 (before F2 - James): Weather related Insurance products are designed, tested, and brought to scale with implementing partners **Brief bullet points of your expected annual 2015 contribution towards the selected MOG:** <Not Defined> **Brief summary of your actual 2015 contribution towards the selected MOG:** CCAFS improved the weather thresholds for WBCIS in India, these weather thresholds protect farmers from adversaries of weather in better way. These thresholds reduce the basis risk in WBCIS schemes. **Brief`2015 plan of the gender and social inclusion dimension of the expected annual output:** <Not Defined> **Summary of the gender and social inclusion dimension of the 2015 outputs:** Not applicable to this project.

F1 (before F4 - Philip): Priority setting contextualised with national stakeholders and capacity strengthened to apply outputs in policy formulation; including trade-off analyses, foresight activities, and quantification of regional socio-economic scenarios

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: Engagement and communication meetings with all the stakeholders have been done. multi-objective trade-off analyses, socio-economic scenario analysis is done for formulating NAPs/SAP.

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: Gender issues are included in analysis.

F4 (before F2 - James): New climate information and analysis that enhances the capacity of data providers (e.g. regional and national meteorological institutions) to meet the demands of climate service beneficiaries

Brief bullet points of your expected annual 2015 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2015 contribution towards the selected MOG: Capacity of partner (WFP) is raised for handling near real time climate data through various sources a and its use in crop yield forecasting.

Brief`2015 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2015 outputs: Not applicable to this project.

Major Output groups - 2014

F4 (before F2 - James): Decision support systems improved or developed for incorporation into national food security safety net programs

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

F2 (before F1 - Andy): Biophysical, socio-economical and tradeoffs analyses (incl. enabling environments and gender), innovative methods, engagement approaches and customized decision support tools for CSA prioritization, wide scale adoption, local adaptation and investment planning (LAM, WA, EA, SA, SEA)

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

F4 (before F2 - James): Weather related Insurance products are designed, tested, and brought to scale with implementing partners

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

F1 (before F4 - Philip): Priority setting contextualised with national stakeholders and capacity strengthened to apply outputs in policy formulation; including trade-off analyses, foresight activities, and quantification of regional socio-economic scenarios

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

F4 (before F2 - James): New climate information and analysis that enhances the capacity of data providers (e.g. regional and national meteorological institutions) to meet the demands of climate service beneficiaries

Brief bullet points of your expected annual 2014 contribution towards the selected MOG: <Not Defined>

Brief summary of your actual 2014 contribution towards the selected MOG: <Not Defined>

Brief`2014 plan of the gender and social inclusion dimension of the expected annual output: <Not Defined>

Summary of the gender and social inclusion dimension of the 2014 outputs: <Not Defined>

5.2 Deliverables

D2934 - An Action Plan for Adaptation in Bangladesh Agriculture under climate change

Main Information

Type: Reports and other publications

Status: Complete

New expected year: <Not Defined>

Subtype: Research workshop report

Year of expected completion: 2016

Cross-cutting dimension:
- N/A

Deliverable dissemination

Is this deliverable already disseminated: No
Open access: No
Open access restriction: Not Disseminated
License adopted: No

Deliverable Metadata

Disseminated title: An Action Plan for Adaptation in Bangladesh Agriculture under climate change
Description / Abstract: Bangladesh agriculture has come a long way over the last quarter of a century, which accounts for around 16% of GDP at present. Crop sub-sector contributes the lion's share to it, 9 percentage points at the moment. Agriculture in Bangladesh is influenced by climate, its seasonal characteristics and different climatic variables such as temperature, rainfall, humidity, day-length etc. Consequently, climate change as indicated by a rising trend in average temperature and volatility of the precipitation regime will affect agriculture to an extent. On average, weather related natural hazards such as flood and drought as well as salinity already affect respectively 34%, 15% and 4% of total households affected by all hazards and associated with 23%, 6% and 3% respectively of total damage and losses occurring in Bangladesh during 2009-14. Among the sectors, crop cultivation experienced the highest damage and loss (around 36%). The frequency and severity of all these hazards may increase over time as climate change unfolds and with it the prospects for agriculture in general is also going to be uncertain possibly jeopardising food security in the country. For future food security it is absolutely necessary to understand how Bangladesh agriculture can advance in future under climate change. Adaptation to these climatic and related uncertainties thus becomes an urgent task for the country. At its sixteenth session the Conference of Parties (COP) under the United Nations Framework Convention on Climate Change (UNFCCC) took a decision and further elaborated at its seventeenth session in Durban to initiate the process of formulating National Adaptation Plans (NAP) as a way to facilitate effective planning in least developed countries (LDCs) to address climate change issues. The present study is an attempt to prepare an adaptation plan for crop agriculture, which is expected to be an integral part of such a NAP process as and when it begins. The study has followed several steps. First it tries to review the present geophysical, climatic and socio-economic context. Second, future climate change in terms of temperature rise and precipitation

changes have been modeled based on statistical downscaling procedure from global scenarios for 2030 (near term) and 2050 (mid-century). This has been dome both for the nations as a whole as well as agro-ecological zones of the country after clustering original 30 such zones into 11 clustered agro-ecological regions. The policy context for adaptation had been analysed to provide an over-all context for adaptation in the country followed by the core analysis of the present exercise i.e., identification of a set of adaptation technologies. This involved analysing the presently used and other known technologies for production of all seasonal rice crops (aus, aman and boro) as well as wheat, potato, maize, lentils, and oilseeds. These technologies have been assessed against 3 criteria. These are if the technology is capable to produce enough to meet food demand in the country; whether the technology is remunerative enough to farmers to induce them to use it and lastly does it help in lowering greenhouse gas emission from cultivation of these crops. Every assessed technology must pass the tests, at least the first two to be accepted as a potential adaptation technology. The identification of suitable technology has been followed by an analysis of the possible implementation mechanism under three broad heads, viz., the institutional framework at present with recommendations for a more adaptation- friendly one for the future, the financing mechanism and opportunities for future investment for adaptation, the research needs and knowledge management for the future and finally a programme of action on the various identified needs with ball park figures for fund requirements along with institutional responsibilities. The basic findings of climate modelling indicate that both maximum temperature and minimum temperature may increase 0.7°C and 1.7°C annually respectively for both time slices under one of the scenario (called RCP 4.5), while an increase of 0.7°C and 2.2°C may occur under the other global scenario (RCP 8.5) that has been considered. In case of rainfall, 3%-4% change may occur under RCP 4.5 and 4%-6% may occur under RCP 8.5 for both time slices annually. In parallel to that, socio-economic scenarios in respect to crop agriculture reveals that, demand for food particularly non-cereal crops will increase over time while nutrient quality of food may go down due to climate change, which make ensuring food security along with adequate nutrition as a major concern. Future vulnerabilities due to climate related hazards i.e. flood, drought and salinity have been understood based on literature review and analysis over clustered agro-ecological zones. Present adaptation practices by farmers have also been reviewed which illustrates that both planned and autonomous adaptation strategies are being practiced now in different parts of the country for adapting to various climate-related hazards. Farmers are applying their local indigenous knowledge to adapt to the consequences of climate change. A list of several policies, guidelines and plans has been given and discussed. A perusal of these policies reveal a few things, most importantly which seems to indicate that while farmers are smart enough to begin adaptation, at the systemic and policy and planning level much more needs to be done. Available literatures also demonstrate that, food security, nutrition and public health, disaster management and farm management are the core issues to formulate future adaptation needs. The analysis of available technologies indicate that some of the present ones can meet current food demand for rice and potato only, but not enough for future food demand (for other crops under consideration). Several technologies can satisfy one or two constraints but not all, even those which do so such has elements such as laser levelling which are difficult to implement. This pursues us to recommend additional technologies which can ensure food security, ensure farmers' profit and mitigate GHGs emission. All these analyses and other earlier discussion of climate change impacts indicate that one needs to create and disseminate new knowledge and also generate requisite data and information as well as have plans for skill development for carrying out these works. The above analyses and other earlier discussion of climate change impacts indicate that one needs to create and disseminate new knowledge and also generate requisite data and information as well as have plans for skill

development for carrying out these works. Broadly a non-exhaustive list may include the following: • Development and evaluation of various Climate Smart Technologies (fertiliser and water efficient,, bio-fortified varieties, cropping patterns and agronomic practices) in different Agro-ecological conditions/stress-prone hotspots and for various crops particularly Wheat, Oilseed and Pulses apart from rice • Data generation on climate change impact on major crops of Bangladesh though field experimentations Creation of a district-wise database on required data for running dynamic crop models and socio-economic and Trade-off/ optimization models • Identification of appropriate Global/Regional Climate Models and generation of representative data for Bangladesh • Development of skills for conducting prioritization/optimization experiments In this regard, the issues of implementation of the adaptation plan of action may have several major elements as indicated earlier. Particularly regarding it may be said that the over-all present institutional framework can and should be if necessary restructured or rather given new impetus for gearing up its activities in generic terms and more particularly in agriculture. In the short term, not much restructuring may be needed but for longer term, adaptation preparedness requires new way of thinking and doing things. Recommendation has been made to establish an 'Institutional Adaptive Capacity Framework' (IAC) to reorganize and to build capacity which can evaluate national institutions' performance of several key functions critical to adaptation: assessment which are prioritization, coordination, information/ knowledge management, and climate risk management. A properly functioning IAC would indicate good performance in the light of these functions as an indication of a country's overall adaptive capacity. It is also mentioned that much institutional effort needs to be devoted for training the extension agents in new technologies, demonstrating the efficacies of these technologies to the farmers and carry back from them the problems that may and will arise in practice and get solutions from scientists and carry it back to farmers again. The process may be made much quicker through the use of IT in various forms, not least the mobile technology. All these are within the country's grasp. What is needed is the definitive political will and the willingness to try new methods of doing things rather than being in cocoons of the past. For financing mechanism, a broad allocation rule not simply for the prioritized technologies but in general for the additional activities have been discussed. Normal budgets of the Government may be sufficient for additional resources to be made available right away. However, more problematic would be the cost of additional research and extension as new technologies would be needed in future. While the GCF has only recently started its journey, this seems to be the best bet yet for resources for development of technology and extension services for them. GCF procedures are however quite rigorous and complex. Yet, it may be difficult but not impossible particularly as there is a Nationally Designated Authority (NDA) and also accredited implementing agencies although so far save for one no project has yet been submitted or approved. The best immediate bet so far seems to be to seek funding through multilateral development organization including UN agencies. Possibly FAO and UNITAR may be approached for such funding for the types of project that are proposed to be necessary in near future. Finally, this action plan comprises of 9 programmes with 42 clustered AEZ specific actions for short (2016-2030), medium (2031-2050) and long (beyond 2050) term with indicative costs and their respective implementation agencies. Note that water management is crucial for future adaptation. However, only those programmes which directly affect on-farm water use and associated supply issues have been considered here under the proposed programme of actions. However, larger water resource development projects also ultimately have indirect influence on water availability and use in agriculture. Programmes like construction of barrage, dredging of rivers to preserve and divert water in dry season and trans-boundary allocation of water issues under the Ministry of Water Resources may therefore be also considered as an over-all holistic framework for water availability and use

efficiency in future adaptation programmes. All of given programme of actions would require around 2,820 million USD to implement. List of programme of actions are as the following: • Increase water use efficiency • Surface water augmentation • Increase fertilizer use efficiency • Research and development for Climate Smart Agriculture • Crop diversification for resources optimization • Socio-economic suitability of climate smart technologies • Data and knowledge management • Human resources development • Strengthen policies and institutions As a whole, this actionable plan tries to prioritize adaptation options considering expert scrutiny of stakeholders, which basically leads to promoting precision agriculture and commercialization of crop agriculture with strong institutional and financial footing to tackle climate change. Present agriculture action plan may be part of the overall NAP. Ministry of Agriculture (MoA) should participate actively to integrate this plan into NAP and coordinate with Ministry of Environment and Forests (MoEF). Existing institutional arrangement would be sufficient, but procedural challenges should be addressed for future betterment. MoA and Agriculture division of Planning Commission should try to access globally available climate fund like GCF to implement above programme of actions.

Publication / Creation date: 2016-12-01
Language: English
Country: Bangladesh
Keywords: NAP, SAP, Action Plan, Climate Change, Agriculture
Citation: <Not Defined>
Handle: <Not Defined>
DOI: <Not Defined>
Creator / Authors: <Not Defined>

Deliverable Quality check

FAIR Compliant: F A I R

Deliverable Data sharing

Deliverable files:
https://marlo.cgiar.org/data/ccafs/projects//119/deliverableDataSharing/An%20Action%20Plan%20for%20Adaptation%20in%20Bangladesh%20Agriculture%20%20under%20CC.pdf

Partners contributing to this deliverable:

Institution	Partner	Type
CEGIS - Center for Environmental and Geographic Information Services	Khan, Malik Fida A. <mkhan@cegisbd.com>	Responsible

D2935 - Continued use of CRAFT for crop monitoring in Nepal

Main Information

Type: Outreach products

Subtype: Article for media/Magazine/Other (not peer-reviewed)

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:
- Capacity Development

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: Other

Dissemination URL: http://www.neksap.org.np/

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: In-season Wheat Yield Forecast in Nepal (Winter 2015/2016) using CRAFT- FINAL REPORT

Description / Abstract: The periodic crop situation updates using CRAFT are released through NeKSAP website. The Food Security Bulletins issued by NeKSAP also highlights the crop situation updates using CRAFT.

Publication / Creation date: 2016-08-31

Language: English

Country: Nepal

Keywords: <Not Defined>

Citation: <Not Defined>

Handle: NeKSAP

DOI: <Not Defined>

Creator / Authors: <Not Defined>

Partners contributing to this deliverable:

Institution	Partner	Type
WFP - World Food Programme	Kanel, Damoder <damodar.kanel@wfp.org>	Responsible

D2842 - Prioritizing Climate-Smart Agricultural Interventions at Multiple Spatial and Temporal Scales

Main Information

Type: Articles and Books

Subtype: Journal Article (peer reviewed)

Status: Complete

Year of expected completion: 2016

New expected year: <Not Defined>

Cross-cutting dimension:
- N/A

Deliverable dissemination

Is this deliverable already disseminated: Yes

Dissemination Channel: CGSpace

Dissemination URL:
https://cgspace.cgiar.org/handle/10568/77225

Open access: Yes

License adopted: No

Deliverable Metadata

Disseminated title: Prioritizing Climate-Smart Agricultural Interventions at Multiple Spatial and Temporal Scales

Description / Abstract: A range of technological, institutional and policy options has been proposed to help agriculture become climate-smart, including weather insurance, spatial weather forecasts, agricultural diversification, stress-tolerant crop varieties, community management of soil and water resources, and policies related to water and carbon management (Long et al., 2015). These interventions have varying costs and economic impacts. Their implementation requires appropriate investment decisions in both on-farm capital and wider agricultural outreach programmes. Furthermore, climate-smart investment can have a wide range of scales ranging from the single field up the national level. It is unlikely that investment in any single intervention will provide optimal benefits, but rather an integrated portfolio of interventions is required to best support adaptation to climate change in agriculture across a range of scales. This spatial complexity is compounded by the long timeframes associated with climate change, requiring further consideration of when as well as where to prioritize investment in any set of intervention options. Decision support tools are therefore needed that can assist different stakeholders to prioritize and hence take appropriate strategic interventions to transform agriculture to become climate-resilient, adaptive and efficient. This study describes the the Climate Smart Agricultural Prioritization (CSAP) toolkit.

Publication / Creation date: 2016-10-01

Language: English

Country: India

Keywords: Adaptation, Climate change, Database development, Land-use planning, Mitigation, Prioritization

Citation: Shirsath, P. B., Aggarwal, P. K., Thornton, P. K., & Dunnett, A. (2017). Prioritizing

climate-smart agricultural land use options at a regional scale. Agricultural Systems, 151, 174-183.
Handle: Elsevier
DOI: http://dx.doi.org/10.1016/j.agsy.2016.09.018
Creator / Authors:
● Shirsath - Paresh<0000-0003-3266-922X>
● Aggarwal, - Pramod K.
● Thornton, - Philip K.
● Dunnett, - Alex

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Deliverable Quality check

FAIR Compliant: F A I R

Partners contributing to this deliverable:

Institution	Partner	Type
IWMI - International Water Management Institute	Shirsath, Paresh B <p.bhaskar@cgiar.org>	Responsible
IWMI - International Water Management Institute	Aggarwal, Pramod <P.K.Aggarwal@cgiar.org>	Other

5.3 Project Highlights

Project highlight 204

Title: Capacity development of government and academia in Nepal for crop yield forecasting

Author: Dhiraj Gyawali and Paresh Bhaskar Shirsath	**Subject:** Crop Yield Monitoring, CRAFT
Publisher: CCAFS	**Year reported:** 2016
Project highlights types: ● Capacity enhancement	**Is global:** No
Start date: Jan 2016	**End date:** Dec 2016
Keywords: Crop Yield Monitoring, CRAFT, Nepal, Crop outlook, NeKSAP	**Countries:** Nepal

Highlight description: Reliable, scientific, timely and precise crop yield forecasts hold crucial relevance to Nepal where production forecasts are largely based on traditional methods and in most of the cases are available only after crop harvests. CCAFS-South Asia, United Nations' World Food Programme and Nepal Food Security Monitoring System (NeKSAP) are implementing an innovative approach for crop yield forecasting. This is helping the government in making early agricultural production forecasts for paddy and wheat crops. The CCAFS Regional Agricultural Forecasting Toolbox (CRAFT) for South Asia uses historical databases of weather and crop yields and current weather to estimate yields of various crops in advance. It can provide policymakers and stakeholders precise information on the likely volume of crop production in specific areas at different times of the year. Using CRAFT, the NeKSAP has produced in-season crop yield forecasts for paddy and wheat for the years 2014, 2015 and 2016. The results have been very encouraging. Hence, NeKSAP is now focusing on promotion of the CRAFT tool to further broaden the network and develop capacity of the government, national and research organizations and academia to use the tool, produce forecasts and disseminate the results to relevant stakeholders. This process in the long run will help CRAFT to be sustained within the system for strengthening food security early warning and provide useful insights for in-season risk management in agriculture. So far, nine training sessions covering about 200 participants have been undergone capacity building training on CRAFT.

Introduction / Objectives: To develop capacity of the government, national and research

organizations and academia to use the CRAFT tool and to promote the CRAFT tool to further broaden the network.

Results: The first round of training of about 200 participants had indicated that CRAFT has a very good potential for upscaling in a stakeholder driven coordination approach, with each agency willing to play their part in resource sharing and ownership of results. The Agriculture and Forestry University in Nepal has also expressed a strong commitment to include crop modelling (including CRAFT) in its graduate course curriculum.

Partners: Ministry of Agriculture, United Nations' World Food Programme, FAO and Nepal Food Security Monitoring System (NeKSAP)
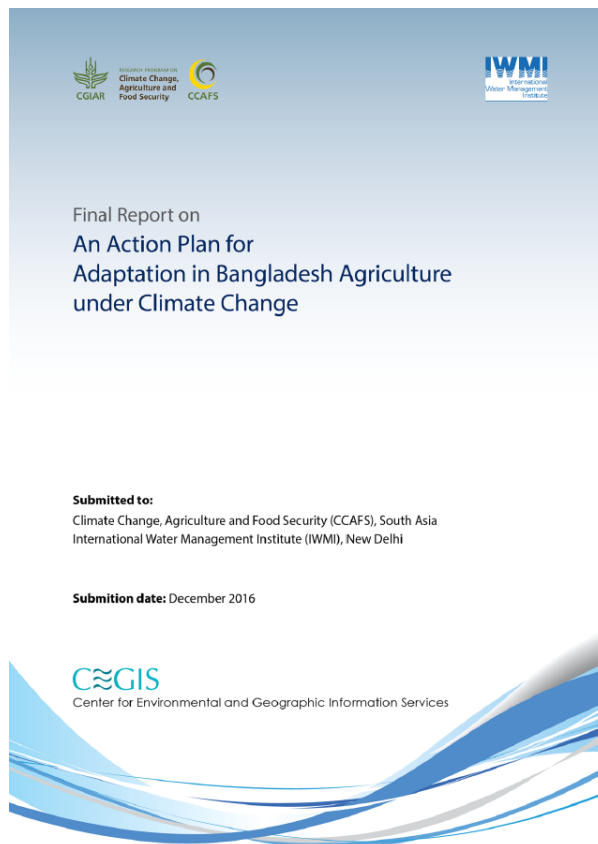
Links / Sources for further information:
https://ccafs.cgiar.org/news/capacity-development-government-and-academia-nepal-crop-yield-forecasting#.WKa_jjt96Uk
http://neksap.org.np/allevents/final-report-of-in-season-wheat-yield-forecast-winter-2015-2016-using-craft-in-nepal

Project highlight 205

Title: An Action Plan for Adaptation in Bangladesh Agriculture under Climate Change

Author: CEGIS		**Subject:** NAPs/SAP	
Publisher: CEGIS		**Year reported:** 2016	
Project highlights types: ● Capacity enhancement ● Policy engagement ● Food security		**Is global:** No	
Start date: Jan 2016		**End date:** Dec 2016	
Keywords: Adaptation, Climate Chnage, Prioritization, NAP		**Countries:** Bangladesh	

Highlight description: Agriculture in Bangladesh is influenced by climate, its seasonal characteristics and different climatic variables such as temperature, rainfall, humidity, day-length etc. Consequently, climate change as indicated by a rising trend in average temperature and volatility of the precipitation regime will affect agriculture to an extent. On average, weather related natural hazards such as flood and drought as well as salinity already affect respectively 34%, 15% and 4% of total households affected by all hazards and associated with 23%, 6% and 3% respectively of total damage and losses occurring in Bangladesh during 2009-14. Among the sectors, crop cultivation experienced the highest damage and loss (around 36%). The frequency and severity of all these hazards may increase over

time as climate change unfolds and with it the prospects for agriculture in general is also going to be uncertain possibly jeopardizing food security in the country. For future food security it is absolutely necessary to understand how Bangladesh agriculture can advance in future under climate change. Adaptation to these climatic and related uncertainties thus becomes an urgent task for the country. At its sixteenth session the Conference of Parties (COP) under the United Nations Framework Convention on Climate Change (UNFCCC) took a decision and further elaborated at its seventeenth session in Durban to initiate the process of formulating National Adaptation Plans (NAP) as a way to facilitate effective planning in least developed countries (LDCs) to address climate change issues. The present study is an attempt to prepare an adaptation plan for crop agriculture, which is expected to be an integral part of such a NAP process as and when it begins.

Introduction / Objectives: The overall objective of this action plan is to prepare a coherent and implementable adaptation plan for crop agriculture in the context of climate change for the future years. More specifically the objectives are: assessment of the vulnerabilities and consequent impacts due to climate change in Bangladesh agriculture, to find possible adaptation strategies to cope up with consequences of climate change at national/AEZ level, to formulate the adaptation strategies through prioritization and to suggest financing and institutional arrangements to coordinate the integrated development activities related to the Action Plan.

Results: The policy context for adaptation had been analysed to provide an over-all context for adaptation in the country followed by the core analysis of the present exercise i.e., identification of a set of adaptation technologies. This involved analysing the presently used and other known technologies for production of all seasonal rice crops as well as wheat, potato, maize, lentils, and oilseeds. These technologies have been assessed against 3 criteria. These are if the technology is capable to produce enough to meet food demand in the country; whether the technology is remunerative enough to farmers to induce them to use it and lastly does it help in lowering greenhouse gas emission from cultivation of these crops. The identification of suitable technology has been followed by an analysis of the possible implementation mechanism under three broad heads, viz., the institutional framework at present with recommendations for a more adaptation- friendly one for the future, the financing mechanism and opportunities for future investment for adaptation, the research needs and knowledge management for the future and finally a programme of action on the various identified needs with ball park figures for fund requirements along with institutional responsibilities. Finally, the action plan comprises of 9 programmes with 42 clustered AEZ specific actions for short (2016-2030), medium (2031-2050) and long (beyond 2050) term with indicative costs and their respective implementation agencies. As a whole, this actionable plan tries to prioritize adaptation options considering expert scrutiny of stakeholders, which basically leads to promoting precision agriculture and commercialization of crop agriculture with strong institutional and financial footing to tackle climate change.
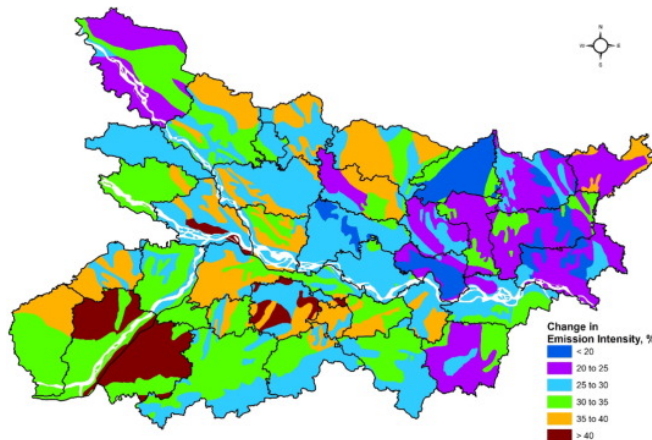
Partners: <Not Defined>

Links / Sources for further information:
https://cgiar-my.sharepoint.com/personal/p_bhaskar_cgiar_org/_layouts/15/onedrive.aspx?id=%2fpersonal%2fp_bhaskar_cgiar_org%2fDocuments%2fAttachments%2fCEGIS-NAPS&FolderCTID=0x0120009D69F314A8C08244B2C33ACFEEF8ADC9

RESEARCH PROGRAM ON
Climate Change, Agriculture and Food Security

CGIAR   CCAFS

Project highlight 206

Title: Prioritizing climate-smart agricultural land use options at a regional scale

Change in Emission Intensity, %
- < 20
- 20 to 25
- 25 to 30
- 30 to 35
- 35 to 40
- > 40

Author: Paresh B. Shirsath, P.K. Aggarwal, A. Dunnett and P.K. Thornton	**Subject:** Adaptation Prioritization
Publisher: Elsevier	**Year reported:** 2016
Project highlights types: ● Breakthrough science ● Policy engagement ● Food security	**Is global:** No
Start date: Jan 2016	**End date:** Dec 2016
Keywords: Adaptation, Climate change, Database development, Land-use planning, Mitigation, Prioritization	**Countries:** India

Highlight description: The promotion of climate-smart agriculture in different parts of the world requires a clear understanding of its relative suitability, costs and benefits, and the environmental implications of various technological interventions in a local context under current and future climates. Such data are generally difficult to obtain from the literature, field surveys and focused group discussions, or from biophysical experiments. This article describes a spreadsheet-based methodology that generates this information based on a region specific production function and 'target yield' approach in current and future climate scenarios. Target yields are identified for homogeneous agroecological spatial units using published crop yield datasets, crop models, expert judgement, biophysical land characterisations, assessment of yield gaps and future development strategies. Validated production/transfer functions are used to establish relationships between inputs (water, seed, fertilizer, machinery, energy, labour,costs) and outputs (crop yields, residues, water and fertiliser use efficiencies, greenhouse gas emissions, financial returns). The process is repeated for all spatial units of the region, identified through detailed mapping of critical biophysical factors, and for all suitable current and potential agronomic production technologies and practices. The application of this approach is illustrated for prioritizing agronomic interventions that can enhance productivity and incomes, help farmers adapt to current risk, and decrease greenhouse gas emissions in current and future climates for the flood- and drought-prone state of Bihar in north-eastern India.

Introduction / Objectives: To provide a spreadsheet based methodology to generate production, economic and environmental databases of agronomic interventions for different regions and for different climate change scenarios. To describe a simple agroecological analysis from the policy planning perspective for prioritizing a crop-technology portfolio across 38 districts in Bihar, India

Results: In general, climate smartness increases with advanced technologies. Yield is the least limiting while emission is the most limiting factor across the entire crop-technology portfolio for climate smartness. Finally, we present a robust climate smart land use plan at district level in Bihar under current and future climate scenarios.

Partners: <Not Defined>

Links / Sources for further information:
http://ac.els-cdn.com/S0308521X16305881/1-s2.0-S0308521X16305881-main.pdf?_tid=e7ae8a16-f4fa-11e6-977f-00000aab0f02&acdnat=1487327094_64490cb1f078f1cc18fd9c4b245ede53

6. Activities

A307 - Spatial monitoring of crop yields in real-time for effective food security planning

Description: This activity supported national partners in gathering and developing high resolution data-sets for yield monitoring purpose. These high resolution data-sets included soil, weather, irrigation, crop variety and fertilizer statistics. These high resolution data-sets were then put in CRAFT schema. For near real time assessment satellite precipitation data-sets from CHIRPS were used. Besides issuing regular updates on crop outlook, CCAFS also worked with national partners in enhancing the capacity of various stakeholder including Government officials, academia and researchers through series of training in Nepal. The capacity building imitative is a big stepping stone in taking the CRAFT outputs to sub-national level planning. These training workshop also helped CRAFT team in assembling the data-sets for assessment at sub-national level.

Start date: Jan 2015   **End date:** Dec 2016

Activity leader: IWMI - International Water Management Institute Shirsath, Paresh B <p.bhaskar@cgiar.org>
Status: Complete

Overall activity or progress made during this cycle: Activity completed; new activity planned and described in P259.

Deliverables in this activity:

- D2935: Continued use of CRAFT for crop monitoring in Nepal

A308 - Development of Action Plans for Adaptation in Agriculture under Climate Change at National/Sub-National Levels

Description: This activity was implemented in collaboration with FL1 and FL4 and national partners will focus on 1) finalisation of the toolkit being developed, 2) formulation of adaptation strategies and programmes at national and sun-national level through adaptation prioritization tools and expert judgment; 3) Preparation of implementation strategies for agriculture through enhancing capacity for planning or implementing adaptation This activity resulted in case study for adaptation prioritization using multi-objective analysis and databases for Bihar, India and it also provided key inputs in development of an action plan for adaptation to climate change in Bangladesh agriculture. The toolkit prioritized the technology portfolio under current climatic variability and future climatic uncertainties, these identified technologies then with stakeholders consultation and expert judgment resulted in development of action plan of 9 programmes with 42 clustered AEZ specific actions for short, medium and long term with indicative costs and their respective implementation agencies.

Start date: Jan 2015 **End date:** Dec 2016

Activity leader: IWMI - International Water Management Institute Shirsath, Paresh B <p.bhaskar@cgiar.org>
Status: Complete

Overall activity or progress made during this cycle: Activity completed.

Deliverables in this activity:

- D2934: An Action Plan for Adaptation in Bangladesh Agriculture under climate change
- D2842: Prioritizing Climate-Smart Agricultural Interventions at Multiple Spatial and Temporal Scales

A309 - Developing improved products for agricultural risk management including insurance and ICT services

Description: This activity which has led to early outcomes for CCAFS in past will be strengthened. For 2015, the major activities are: 1) review the existing weather insurance triggers; 2) development of improved triggers through crop modelling and statistical analyses; 3) communicating improved weather thresholds with government agencies and insurance companies. 4) developing and evaluating opportunities for engaging farmers in MRV of insurance schemes and bundling of insurance with other risk management options 5) strengthening/developing ICT based toolkit for targeted delivery of weather forecasts and CSA knowledge to stakeholders.

Start date: Jan 2015   **End date:** Dec 2016

Activity leader: IWMI - International Water Management Institute Aggarwal, Pramod <P.K.Aggarwal@cgiar.org>
Status: Complete

Overall activity or progress made during this cycle: <Not Defined>

Deliverables in this activity:

<Not defined>

A311 - Regional engagement and capacity strengthening for use of decision support tools by stakeholders

Description: CCAFS South Asia team will strategically engage with various stakeholders by organizing workshops, training and other national and regional meetings. This engagement will increase stakeholders' knowledge on various tools and application in adaptation planning.

Start date: Jan 2015   **End date:** Dec 2016

Activity leader: IWMI - International Water Management Institute Aggarwal, Pramod <P.K.Aggarwal@cgiar.org>
Status: Complete

Overall activity or progress made during this cycle: <Not Defined>

Deliverables in this activity:

<Not defined>

7. Leverages

No leverages added