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WHEAT CRP

Theories of Change

February 2016

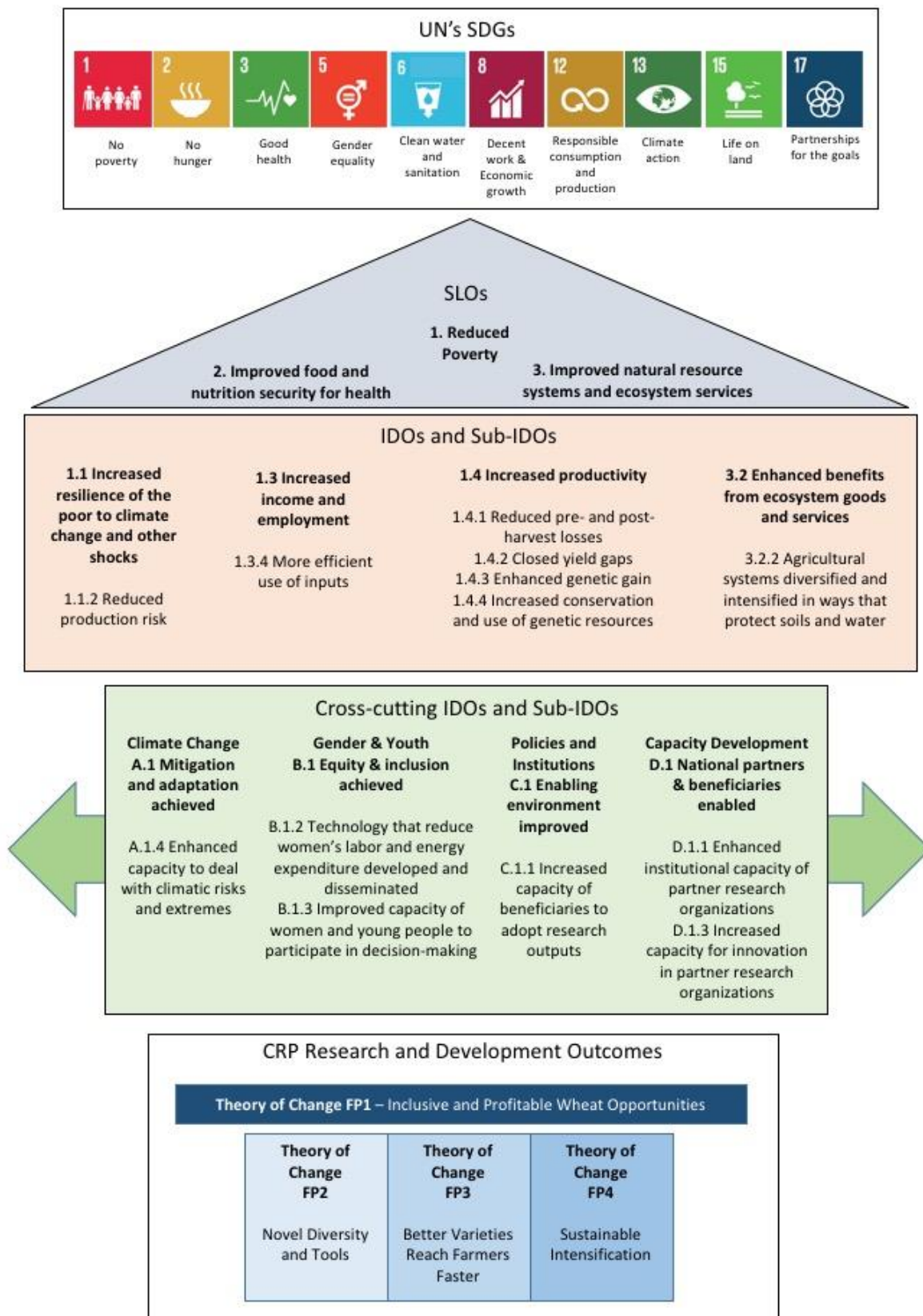
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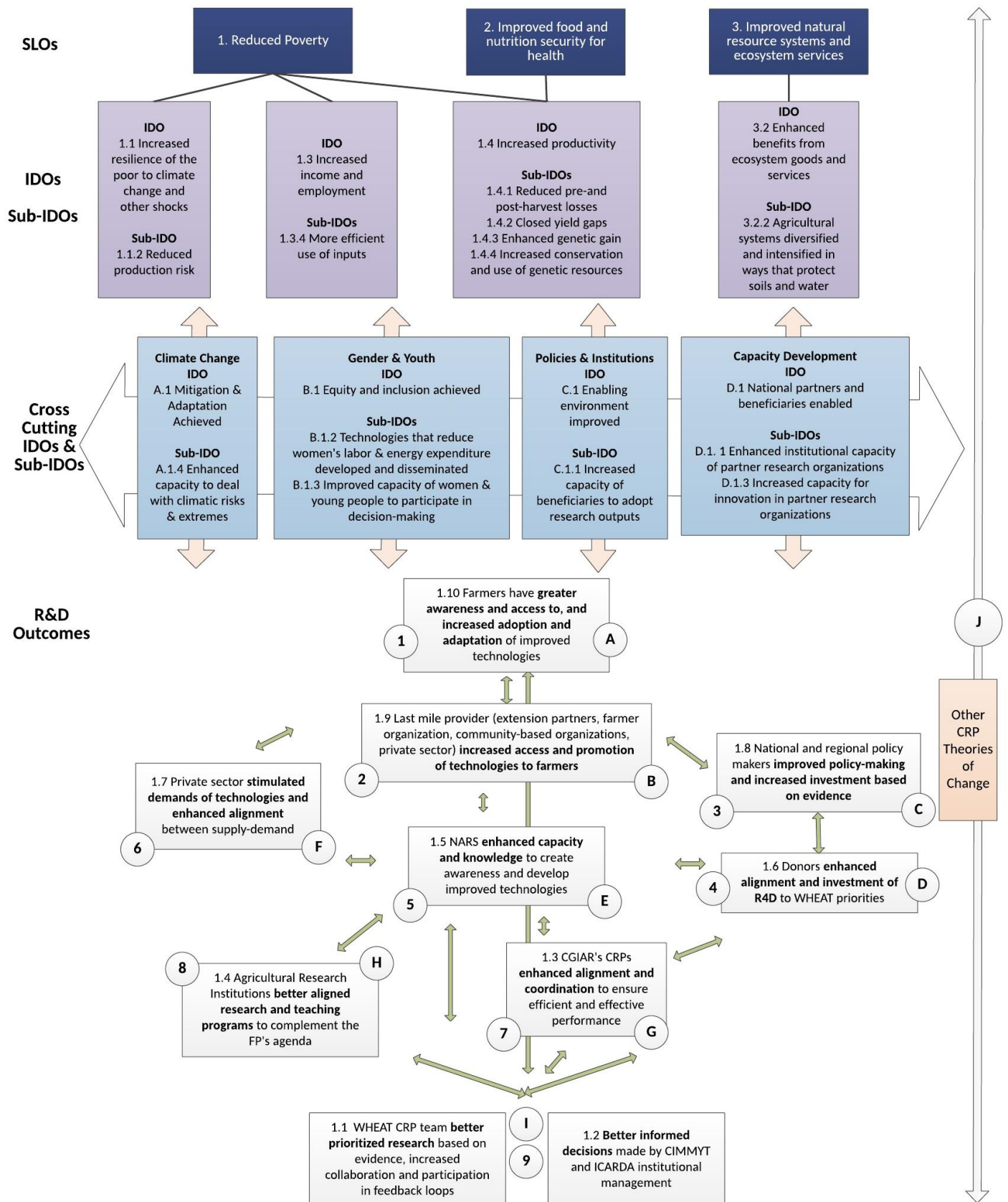


RESEARCH
PROGRAM ON
Wheat

Figure 1: WHEAT CRP Impact Pathway



Theory of Change for Inclusive and Profitable Wheat Opportunities (FP1)

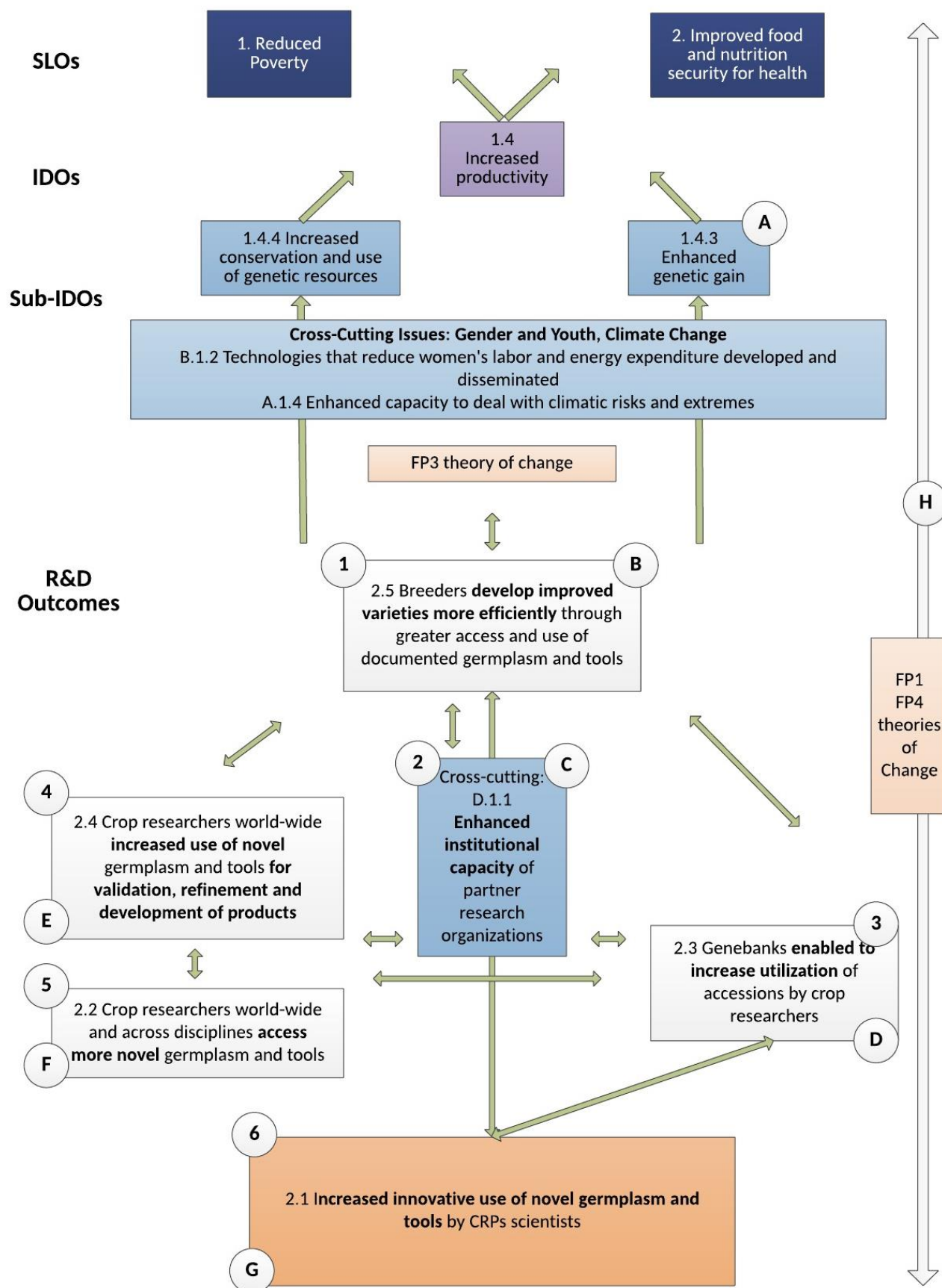


Assumptions and Risks	Interventions and Outputs
<p>A</p> <ul style="list-style-type: none"> Farmers are aware and have access to improved technologies Farmers see value in improved technologies Improved technologies are relevant, affordable, profitable and suitable to farmer needs <p>B</p> <ul style="list-style-type: none"> Partners have capacity, infrastructure and are willing to scale out technologies Risks: <ul style="list-style-type: none"> Existence of an enabling environment for scaling out Lack of and change in funding and political support <p>C</p> <ul style="list-style-type: none"> Existence of enabling policy environment and government support to make policy based on evidence Policy makers are receptive to research information and use it Risk: Frequent conflicting and competing priorities <p>D</p> <ul style="list-style-type: none"> Donors share our priorities and vision, and are willing to collaborate and share knowledge Donors have the capacity to collaborate Benefits of collaboration outweighs transaction costs Risks: <ul style="list-style-type: none"> Priority changes away from agricultural research for development CGIAR and CRP mission drift away from mission, values, capacity, priorities <p>E</p> <ul style="list-style-type: none"> Partners see value and are willing to collaborate Existence of an enabling environment and government support Risks: <ul style="list-style-type: none"> Lack of financial and human capacity of NARS Conflict of interests Over-commitment or lack of commitment Staff turnover <p>F</p> <ul style="list-style-type: none"> Existence of an enabling environment for private sector involvement Private sector is willing to collaborate and share knowledge Private sector has the capacity to collaborate Benefits of collaboration outweighs transaction costs 	<p>1</p> <ul style="list-style-type: none"> Identify and share within CRP adoption constraints and incentives, and costs-benefit analysis of technologies <ul style="list-style-type: none"> Outputs: Constraints, incentives and cost-benefit information and associated data; dissemination documentation Evaluate difference approaches of awareness creation and dissemination and share best practices within CRP <ul style="list-style-type: none"> Outputs: Best practices; dissemination documentation <p>2</p> <ul style="list-style-type: none"> Conduct formalized needs and capacity assessments of partnering last mile providers, identify gaps and best fits and share findings within CRP <ul style="list-style-type: none"> Outputs: Needs and capacity of last mile providers, gaps and best fit organizations; dissemination documentation Develop and provide targeting information, targeting capacity building and extension material packages <ul style="list-style-type: none"> Outputs: Information and associated data; training and associated materials; dissemination documentation Conduct research on scaling out pathways to enhance dissemination of adoption <ul style="list-style-type: none"> Outputs: Research information and associated data; dissemination documentation <p>3</p> <ul style="list-style-type: none"> Identify opportunities for CRP to influence policy making and share within CRP <ul style="list-style-type: none"> Outputs: Opportunities documented; dissemination documentation Develop and provide policy advice to multiple audiences (CRPs, multilateral organizations, donors, local and regional governments) to influence policy-making <ul style="list-style-type: none"> Outputs: Policy briefs; advice; dissemination documentation <p>4</p> <ul style="list-style-type: none"> Collect, document and share within CRP donor intelligence (e.g., motivation, mission, priorities, indicators) <ul style="list-style-type: none"> Outputs: donor intelligence; dissemination documentation Prepare marketing / communication products on research findings and benefits of WHEAT products and share with donors

Assumptions and Risks	Interventions and Outputs
<ul style="list-style-type: none"> Risks: <ul style="list-style-type: none"> Fails to see opportunities for diverse groups / interests Potential for emergence of ethical issues <p>G</p> <ul style="list-style-type: none"> CPRs are willing to collaborate and share knowledge CRPs have the capacity to collaborate Benefits of collaboration outweighs transaction costs Risks: <ul style="list-style-type: none"> CGIAR and CRP mission drift away from mission, values, capacity, priorities Limited investment to develop capacity and collaborate <p>H</p> <ul style="list-style-type: none"> ARIs are willing to collaborate and share knowledge ARIs have the capacity to collaborate Benefits of collaboration outweighs transaction costs <p>I</p> <ul style="list-style-type: none"> Existence of an enabling environment for collaborating, networking, communicating, knowledge sharing, innovation, critical thinking, taking risks and learning from failures where: <ul style="list-style-type: none"> Feedback and constructive criticism is encouraged and operationalized across the institutions Time, resources and incentives exist Management provide active and continuous support, guidance and direction Benefits of collaboration outweighs transaction costs Existence of an effective communication approach Risks: <ul style="list-style-type: none"> Lack of ability to retain talent and hire the right people Lack of effective tools for collaboration Internal performance evaluation processes are not adaptable to support collaboration <p>J</p> <ul style="list-style-type: none"> Risks: <ul style="list-style-type: none"> New emerging pests and diseases Financial, social and political instability Climate change 	<ul style="list-style-type: none"> Outputs: Policy briefs; marketing / communication products; dissemination documentation <p>5</p> <ul style="list-style-type: none"> Conduct formalized needs and capacity assessment of partnering NARS and identify gaps <ul style="list-style-type: none"> Outputs: Identified needs and capacity, and gaps Develop and provide training, services and mentoring <ul style="list-style-type: none"> Outputs: Training and associated materials; services documentation; dissemination documentation <p>6</p> <ul style="list-style-type: none"> Develop and provide strategic advice to CRP on best practices in collaborating with the private sector <ul style="list-style-type: none"> Outputs: Advice; products; data; dissemination documentation Develop and provide information on emerging marketing opportunities and on CRP products and services to the private sector <ul style="list-style-type: none"> Outputs: Policy briefs; information and associated data; dissemination documentation <p>7</p> <ul style="list-style-type: none"> Identify cost-effective opportunities for enhancing collaboration and complementarity with other CRPs and share within CRP, preferably via integration site plans <ul style="list-style-type: none"> Outputs: Opportunities documented; dissemination documentation Share research findings with other CRPs <ul style="list-style-type: none"> Outputs: Research information and associated data; products; dissemination documentation Contribute to joint initiative, preferably via integration site plans <ul style="list-style-type: none"> Outputs: Knowledge; products; data; dissemination documentation <p>8</p> <ul style="list-style-type: none"> Define and regularly revise a collaborative research agenda <ul style="list-style-type: none"> Outputs: Collaborative research agenda (e.g., areas for research, associated institutions) <p>9</p> <ul style="list-style-type: none"> Comprehensive and regularly updated foresight and targeting approach (i.e., analysis) based on

Assumptions and Risks	Interventions and Outputs
	<p>CRP needs</p> <ul style="list-style-type: none"> ○ Outputs: Approach; regularly updated data; FP needs ● Foresight and targeting information provided to CRP <ul style="list-style-type: none"> ○ Outputs: Foresight and targeting information and associated data; dissemination documentation ● Conduct and share with CRP cost-benefit analysis of interventions <ul style="list-style-type: none"> ○ Outputs: Cost-benefit information and associated data; dissemination documentation ● Conduct analysis on research prioritization and share advice and recommendations to CRP <ul style="list-style-type: none"> ○ Outputs: Prioritization information and associated data; dissemination documentation ● Provision of technical support <ul style="list-style-type: none"> ○ Outputs: Technical materials; training and associated materials ● Provide internal and external capacity building in the integration of gender and youth <ul style="list-style-type: none"> ○ Outputs: Training and associated materials

Theory of Change for Novel Diversity and Tools (FP2)

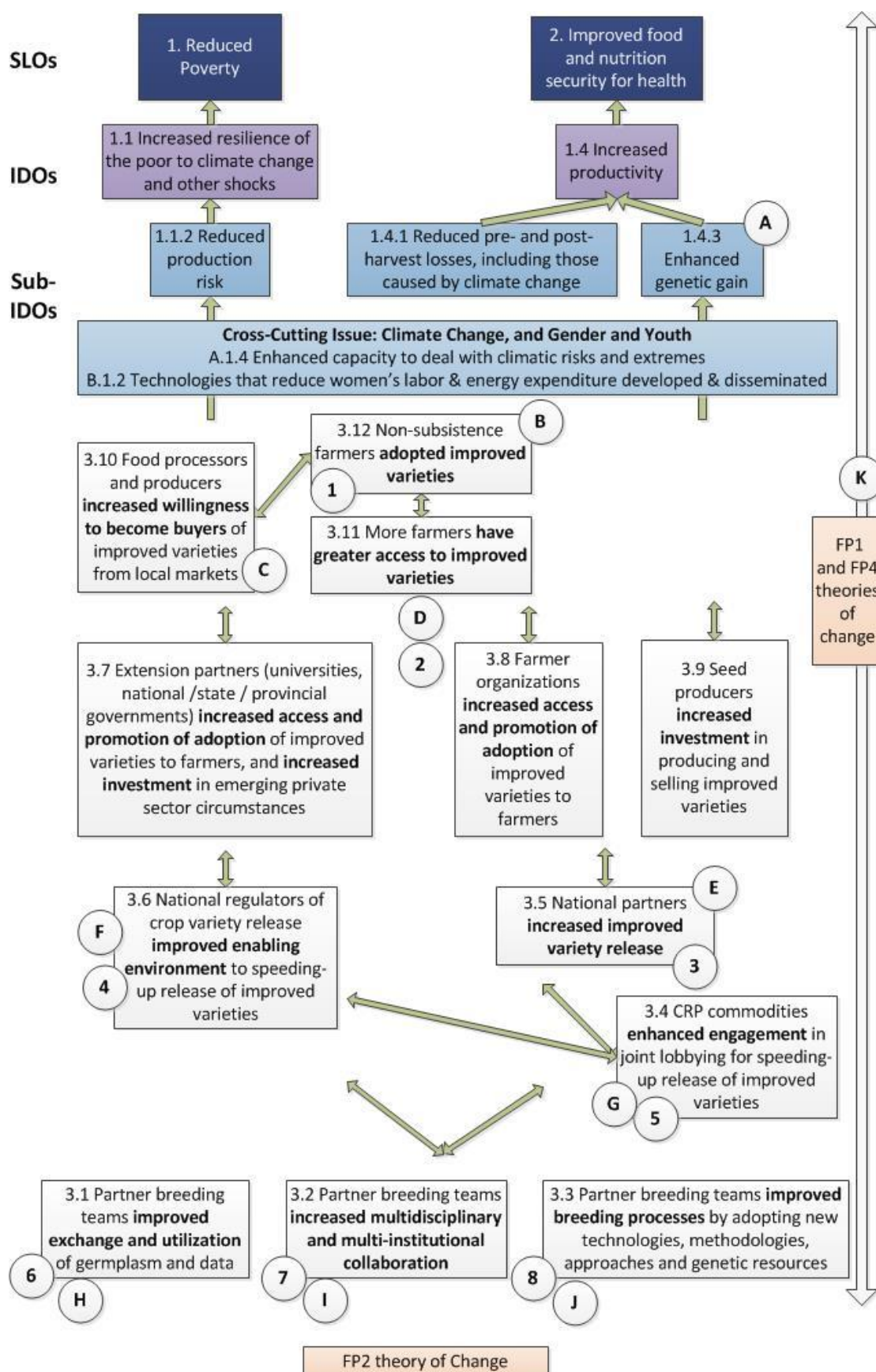


Assumptions and Risks	Interventions and Outputs
<p>A • Enhanced genetic gain encompasses all elements of gain sought by the CRP (e.g., yield, abiotic, biotic and quality traits)</p> <p>B • Breeders are adequately funded and are willing to adopt and adapt documented germplasm and tools</p> <ul style="list-style-type: none"> Risks: <ul style="list-style-type: none"> Relevant climate predictions are not precise Unanticipated combinations of abiotic stresses occur Unanticipated pests and/or diseases appear (biotic) requiring new research in germplasm and tools <p>C • Conducive environment for capacity building</p> <ul style="list-style-type: none"> Existence of effective communication and dissemination capacity and systems Effective assessment of the needs and capacity of partners (internal and external) Risk: Staff turnover reduces capacity building efforts <p>D • There will be continuous demand for documented germplasm and tools</p> <ul style="list-style-type: none"> Technologies are cost-efficient <p>E • Crop researchers are adequately funded and are willing to use documented germplasm and tools</p> <ul style="list-style-type: none"> Feedback loops exist to ensure effective communication between CRPs scientists, crop researchers, breeders, and genebanks Strong collaboration exists between CRPs scientists, crop researchers, breeders, and genebanks Risks: Lack of uptake due to the existence of disincentives <p>F • CGIAR has the lobbying power – and uses it - to influence increased international exchange of germplasm</p> <ul style="list-style-type: none"> Target partner countries have/move towards international germplasm exchange policies and practices Availability of resources and existence of 	<p>1 • Develop and provide training to breeders in new methods</p> <ul style="list-style-type: none"> Outputs: training and associated materials <ul style="list-style-type: none"> Disseminate new documented germplasm by demonstrating yield gain potential via open access channels Outputs: documented germplasm, data, dissemination documentation <ul style="list-style-type: none"> Develop marketing approaches, methods and skills to share tools and documented germplasm developed by FP2 Outputs: marketing approaches, methods, and associated dissemination documentation; training and associated materials <ul style="list-style-type: none"> Identify and implement institutional incentives for knowledge sharing (e.g., data sharing measures) and incentivize via employee performance review, including support for publication Outputs: measures for knowledge sharing, knowledge, dissemination documentation, employee performance review <p>2 • Develop and implement a capacity building strategy and plan</p> <ul style="list-style-type: none"> Outputs: Capacity building strategy and work plan, associated capacity building documentation <ul style="list-style-type: none"> Provide appropriate infrastructure support Outputs: technical advice, infrastructure (e.g., hand held data logger, labs) <ul style="list-style-type: none"> Provide research support services Outputs: documentation associated with services (e.g., double-haploids, markers, phenotyping) <ul style="list-style-type: none"> Technical backstopping Outputs: documentation associated with backstopping (e.g., training, IT tools, biometrics) <p>3 • Develop and use informatics tools for diversity analysis</p> <ul style="list-style-type: none"> Outputs: diversity analysis data <ul style="list-style-type: none"> Identify and improve accession and passport information Outputs: accession and passport data <ul style="list-style-type: none"> Rationalize dynamic core sets Outputs: sets <ul style="list-style-type: none"> Explore and complete global diversity in other

Assumptions and Risks	Interventions and Outputs
<p>capacity for dissemination, training and backstopping</p> <p>G</p> <ul style="list-style-type: none"> Funders acknowledge need for holistic solutions Scientists have understanding of the needs of beneficiaries and of the context in which they live Availability of resources and time to conduct needs and capacity assessments Risks: <ul style="list-style-type: none"> Donor funding and accountability structure may inhibit innovation Relevant intellectual property landscape might change Intellectual property issues may constrain use and dissemination of germplasm and tools <p>H</p> <ul style="list-style-type: none"> Existence of an enabling environment allowing scientists to take risks, innovate and learn from failures Scientists have multidisciplinary curiosity Risks: <ul style="list-style-type: none"> Financial, social and political instability New emerging pests and diseases Climate change 	<p>collection</p> <ul style="list-style-type: none"> Outputs: accession and passport data, dissemination documentation <ul style="list-style-type: none"> Disseminate characterization of germplasm <ul style="list-style-type: none"> Outputs: characterized germplasm, dissemination documentation Create databases and consolidate data to manage the information <ul style="list-style-type: none"> Outputs: databases, data <p>4</p> <ul style="list-style-type: none"> Develop and provide training and services (e.g., backstopping) <ul style="list-style-type: none"> Outputs: training and associated materials; services documentation Support partners to properly plan for sustainably taking over complex tools (e.g., Green Global Foundation) <ul style="list-style-type: none"> Outputs: advice, tools, dissemination documentation Develop and implement tool deployment strategies and specialists <ul style="list-style-type: none"> Outputs: deployment strategies, training and associated materials Build customer satisfaction and feedback loop between partner researchers and CRP and between FPs <ul style="list-style-type: none"> Outputs: surveys or other customer satisfaction tools, and associated responses <p>5</p> <ul style="list-style-type: none"> Conduct formalized needs and capacity assessment <ul style="list-style-type: none"> Outputs: Identified needs and capacity Develop and share value proposition/business models <ul style="list-style-type: none"> Outputs: models and associated dissemination documentation Develop and share an integrated holistic product and process description (e.g., protocol and documentation; training and application; documented germplasm, data and markers; accession and passport data) and incentivize via employee performance review Prepare and share comprehensive germplasm development documentation as a service to next users (including meta data development for IWIN) <ul style="list-style-type: none"> Outputs: protocols and associated dissemination documentation, training and associated materials, germplasm data and markers, accession and passport data Develop communication channels and networks (internal and external) to share product description <ul style="list-style-type: none"> Outputs: communication channels and materials; networking tools Advocate (jointly with CRP FPs and other CRPs) for open

Assumptions and Risks	Interventions and Outputs
	<p>access to data and documented germplasm</p> <ul style="list-style-type: none"> ○ Outputs: advice, position papers <p>6 • Develop/refine breeding approaches for targeted environments and beneficiaries (e.g., incorporate GS, DH, hybrids, gene editing)</p> <ul style="list-style-type: none"> ○ Outputs: breeding approaches <p>• Improve existing and develop new phenotyping tools (e.g., remote sensing, sensory, image-based non-invasive) and other tools as deemed appropriate</p> <ul style="list-style-type: none"> ○ Outputs: phenotyping and other tools <p>• Improve existing, develop and perform genotyping tools (e.g., sequencing, GBS)</p> <ul style="list-style-type: none"> ○ Outputs: genotyping tools <p>• Characterize breeding target environments (e.g. agro-ecological zone) and target beneficiaries</p> <ul style="list-style-type: none"> ○ Outputs: breeding target environments characterized, breeding target beneficiaries identified <p>• Conduct high quality phenotyping in well managed field environment, including confined field trials</p> <ul style="list-style-type: none"> ○ Outputs: phenotyping trial data <p>• Biotechnology to generate new diversity (e.g., genome modification, genome editing, mutation)</p> <ul style="list-style-type: none"> ○ Outputs: germplasm data <p>• Perform pre-breeding (e.g., wide-crossing, targeted pre-breeding driven by trait discovery, using different approaches, use of exotics)</p> <ul style="list-style-type: none"> ○ Outputs: pre-breeding germplasm data <p>• Discover, document and share characterization of germplasm driven by traits, biotic, abiotic factors, including quality and agronomic needs</p> <ul style="list-style-type: none"> ○ Outputs: germplasm data and associated dissemination documentation <p>• Discover, document and share markers for unique alleles/haplotypes</p> <ul style="list-style-type: none"> ○ Outputs: marker data and associated dissemination documentation <p>• Fostering effective networking with other initiatives, especially upstream</p> <ul style="list-style-type: none"> ○ Outputs: Scientific information regularly shared and received <p>• Develop and implement integrated germplasm information system (genealogy, phenotypic, genotypic, sensor, and environmental data)</p> <ul style="list-style-type: none"> ○ Outputs: Integrated germplasm information system

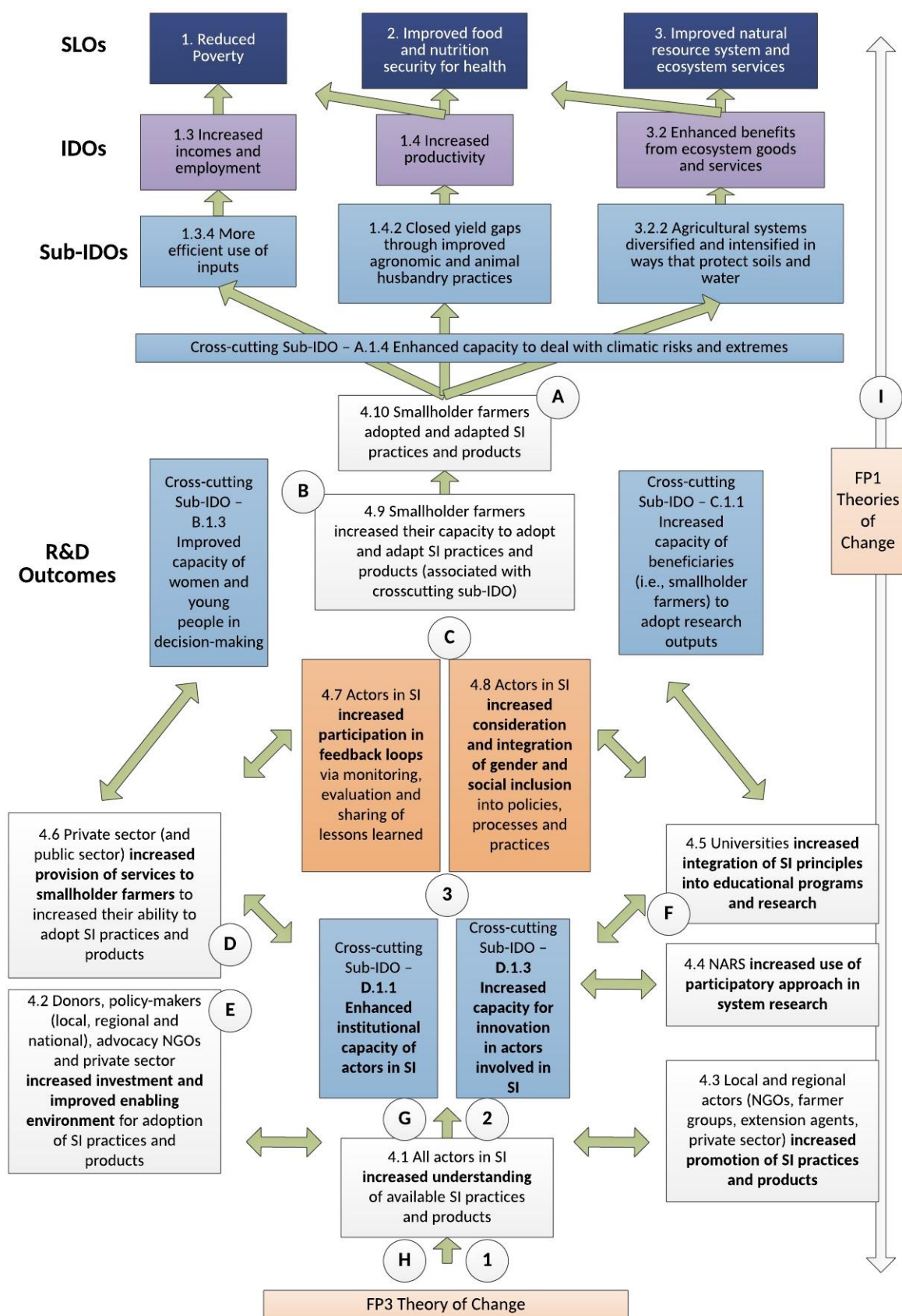
Theory of Change for Better Varieties Reach Farmers Faster (FP3)



Assumptions and Risks	Interventions and Outputs
<p>A • Enhanced genetic gain encompasses all elements of gain sought by the CRP (e.g., yield, abiotic, biotic and quality traits)</p> <p>B • Farmers will be available to sell improved varieties</p> <ul style="list-style-type: none"> • Seed systems produces sufficient seeds for farmers • Profitability of the improved varieties • Market prices are stable and attractive to farmers • Risks: Variability of local wheat prices and instability of global prices <p>C • Quality and availability of improved varieties are attractive to buyers</p> <ul style="list-style-type: none"> • Profitability of improved varieties • Improved varieties driven by markets, and by nutrition and health needs <p>D • Farmer organization can make profit with associated services</p> <ul style="list-style-type: none"> • Seed production/systems will become more commercially attractive • Existence of an inter-CRP collaboration • Existence of an enabling policy and legislative environment to increase access to improved varieties and seed commercialization <p>E • Existence of opportunities to speed-up improved varieties release</p> <ul style="list-style-type: none"> • National partners use CGIAR trial data to speed-up improved variety release • National partners see value, and are willing and capable to implement incentive systems (e.g., royalty systems) • Global precision platforms contribute to speeding-up release adoption of improved variety <p>F • Existence of opportunities to speed-up improved variety release</p> <ul style="list-style-type: none"> • CGIAR influence national decision-makers <p>G • CRPs have sufficient time and budget to work together</p> <p>H • Regulators enable and support exchange of data and germplasm</p> <ul style="list-style-type: none"> • Existence of an enabling policy and legislative environment • Risks: National regulators increase importing and 	<p>1 • Enable different partners to provide improved varieties to farmers</p> <ul style="list-style-type: none"> ○ <u>Outputs</u>: dissemination and marketing documentation <p>• Capacity development of farmers</p> <ul style="list-style-type: none"> ○ <u>Outputs</u>: Training materials, training sessions, dissemination and marketing documentation <p>2 • See FP4 and FP1 interventions</p> <p>3 • Communicate summarized data and ensure feedback loop</p> <ul style="list-style-type: none"> ○ <u>Outputs</u>: data, dissemination documentation <p>• Fundraise to support speeding-up release of improved varieties</p> <p>• Include promotional information of improved varieties in innovative platforms</p> <ul style="list-style-type: none"> ○ <u>Outputs</u>: Dissemination and marketing documentation, policy briefs <p>• Implement participatory variety selection extension interventions</p> <ul style="list-style-type: none"> ○ <u>Outputs</u>: data, dissemination and marketing documentation <p>4 • Contribute to policy dialogue</p> <p>• Provide capacity development to decision-makers on breeding realities, value addition, timelines, and research and development</p> <ul style="list-style-type: none"> ○ <u>Outputs</u>: Policy briefs, advice, dissemination documentation <p>4 • Document and analyze legislative systems, and develop common mechanisms and best practices for variety release in target countries</p> <ul style="list-style-type: none"> ○ <u>Outputs</u>: legislative system, mechanisms and best practices overviews and documentation <p>5 • Monitor and lobby jointly with other CRPs to support enabling policy and legislative environment for germplasm exchange</p> <ul style="list-style-type: none"> ○ <u>Outputs</u>: dissemination documentation, advice and policy briefs <p>6 • Disseminate summarized data</p> <ul style="list-style-type: none"> ○ <u>Outputs</u>: data, dissemination documentation <p>• Access capacity and prioritize partners</p>

<p>exporting fees</p> <p>I • Partner have human and financial resources and capacity to collaborate</p> <p>• Risks: Partners have limited investment to develop capacity</p> <p>J • Partners see value and are willing to use new technologies, methodologies, approaches and genetic resources</p> <p>K • CRP WHEAT understands contextual issues related to pests, disease and pathogens</p> <p>• Risks:</p> <ul style="list-style-type: none"> ○ New emerging pests and diseases ○ Financial, social and political instability ○ Climate change 	<ul style="list-style-type: none"> ○ Outputs: partner capacity assessments, list of prioritize partners • Process data from prioritized partners <ul style="list-style-type: none"> ○ Outputs: reviewed data 7 • Implement precision phenotyping platforms (genomic selection, multi-location, multi-traits) <ul style="list-style-type: none"> ○ Outputs: information about precision phenotyping, dissemination documentation • Provide capacity development <ul style="list-style-type: none"> ○ Outputs: training material, training sessions, • Establish and improve value chains between NARS and markets <ul style="list-style-type: none"> ○ Outputs: value chains, regular assessment and identification of areas for improvement of value chains • Establish and share standards and options <ul style="list-style-type: none"> ○ Outputs: standards and options, dissemination documentation 8 • Develop, test and share new breeding technologies, methodologies, approaches and genetic resources <ul style="list-style-type: none"> ○ Outputs: technologies, methodologies, approaches and genetic resources, testing data, dissemination documentation • Discover and share new genes for breeding <ul style="list-style-type: none"> ○ Outputs: genes and associated data, dissemination data • Monitor and share information regarding pests and diseases <ul style="list-style-type: none"> ○ Outputs: pests and diseases data, dissemination data
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Theory of Change for Sustainable Intensification (FP4)



Assumptions and Risks	Interventions and Outputs
<p>A • SI practices and products are adaptable to other environment and systems.</p> <p>• Smallholder farmers see benefits and are able to adopt/adapt SI practices and products</p> <p>B • Smallholder farmers see value in achieving more efficient use of inputs, closing yield gap, and diversifying and intensifying agricultural systems</p> <p>• Smallholder farmers are aware and have access to SI practices and products</p> <p>C • Actors in SI are willing and able to participate in research, capacity building and/or improving the enabling environment for adoption of SI practices and products</p> <p>• Alignment of common interest among actor in SI</p> <p>• Actors in SI act to contribute to gender responsiveness and social inclusion</p> <p>D • Private sector recognize the importance of SI practices and products</p> <p>• Risks: business interest negatively effects the adoption of SI practices and products; potential for emergence of ethical issues</p> <p>E • Donors, policy-makers, advocacy NGOs and private sector have interest and power to share the enabling environment</p> <p>• Risk: Frequent conflicting and competing priorities negatively effects the research in and adoption of SI practices and products</p> <p>F • Co-research processes lead to integration of SI principles into educational programs and research</p> <p>G • CRP has understanding of the institutional landscape and has the means to influence it</p> <p>H • Actors in SI are reached, the right message is delivered and understood</p> <p>• Existence of need and incentive for intensification</p> <p>• SI practices and products address locally important challenges and opportunities</p> <p>• Organization sufficiently recognizes or incentives the importance of networking, communicating, knowledge sharing, innovation, necessity of rebranding and critical thinking</p> <p>• Risks: Focus placed on publications instead of the overall results of the theory of change</p> <p>I • Risks: Financial, social and political instability, climate change</p>	<p>1 • Research:</p> <ul style="list-style-type: none"> ○ Technological options for sustainable intensification of cropping systems ○ Sustainable farming systems and livelihood intensification strategies ○ Enabling policies and sustainable intensification landscape ○ <u>Outputs</u>: technologies, policies, decision support tools, extension programs, publications <p>• Develop and implement communication and marketing strategy</p> <ul style="list-style-type: none"> ○ <u>Outputs</u>: Communication and marketing strategy <p>• Develop and implement a partnership/networking strategy</p> <ul style="list-style-type: none"> ○ <u>Outputs</u>: Partnership/networking strategy <p>2 • Provide training (on the job, workshops, short and long term training)</p> <ul style="list-style-type: none"> • Arrange exchange visits • Brokering (management and dissemination) of knowledge (to all partners) • Contribution to the development of decision support materials • Contribute to business promotional materials • Business model development • Joint product development ○ <u>Outputs</u>: training material, promotional products, decision support tools, communication products <p>3 • Creating of innovation platforms</p> <ul style="list-style-type: none"> • Gender and social inclusion analysis and identification of appropriate interventions • Gender and social inclusion sensibilization workshops ○ <u>Outputs</u>: innovative platforms, gender responsive and socially inclusive interventions, gender and social inclusion sensibilization training materials