



Rice Agri-Food System CRP, RICE



Performance Indicator Matrix;
July 2016

Performance Indicator RICE - Table A: RICE contributions to SRF targets of the CGIAR and their costs (total over six years, and by funding source)

SRF = Strategy and results framework

CGIAR Target	Target contribution	Unit of target	Amount Needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	Synergies with other CRP's/ Platforms (click Ctrl for multiple selection)
100 million more farm households have adopted improved varieties, breeds or trees, and / or improved management practices	16.5	million farm households	17,000,000	36	30	34	0	PIM
30 million people, of which 50% are women, assisted to exit poverty	13.4	million people	115,500,000	16	43	41	0	PIM
Improve the rate of yield increase for major food staples from current <1% to 1.2-1.5% per year	1.3	%	67,200,000	23	57	20	0	Big Data, Genebanks, Genetic Gain platform
30 million more people, of which 50% are women, meeting minimum dietary energy requirements	17.3	million people	18,100,000	17	21	62	0	
150 million more people, of which 50% are women, without deficiencies in one or more of the following essential micronutrients: iron, zinc, iodine, vitamin A, folate and vitamin B12	8.25	million people	11,750,000	14	32	54	0	A4NH
10% reduction in women of reproductive age who are consuming less than the adequate number of food groups	3	%	11,750,000	14	32	54	0	A4NH, Fish, Maize, Wheat
5% increase in water and nutrient (inorganic, biological) use efficiency in agro-ecosystems, including through recycling and reuse	5	%	15,000,000	13	20	67	0	WLE
Reduce agriculturally-related greenhouse gas emissions by 0.2 Gt CO ₂ -e yr ⁻¹ (5%) compared with business-as-usual scenario in 2022	0.0284	Gt CO ₂ e/yr	47,800,000	16	57	27	0	CCAFS
		Total	304,100,000					

Performance Indicator RICE - Table A: contribution to SRF targets of the CGIAR, by country
SRF = Strategy and results framework

CGIAR Target: 100 million more farm households have adopted improved varieties, breeds or trees, and / or improved management practices
RICE contributions

CGIAR Target countries	Other Country	Target contribution in country (million households)
Mali	–	0.073852
Nigeria	–	0.238554
Tanzania	–	0.094428
Bangladesh	–	1.192771
India	–	4.274096
Vietnam	–	0.761386
OTHER	China	3.002801
OTHER	Indonesia	1.208675
OTHER	Philippines	0.462199
REST OF THE WORLD	–	5.191238

CGIAR Target: 30 million people, of which 50% are women, assisted to exit poverty

CGIAR Target countries	Other Country	Target contribution in country (million people)
Nigeria	–	0.43
Tanzania	–	0.13
Bangladesh	–	1.41
India	–	1.67
Vietnam	–	1.42
OTHER	China	3.44
OTHER	Indonesia	0.16
OTHER	Philippines	0.35
REST OF THE WORLD	–	4.39

CGIAR Target: Improve the rate of yield increase for major food staples from current <1% to 1.2-1.5% per year

CGIAR Target countries	Other Country	Target contribution in country (%/year)
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Mali	–	1.3
Nigeria	–	1.3
Tanzania	–	1.3
Bangladesh	–	1.3
India	–	1.3
Vietnam	–	1.3
OTHER	China	1.3
OTHER	Indonesia	1.3
OTHER	Philippines	1.3

CGIAR Target: 30 million more people, of which 50% are women, meeting minimum dietary energy requirements

CGIAR Target countries	Other Country	Target contribution in country (million people)
Mali	–	0.01
Nigeria	–	0.6
Tanzania	–	0.18
Bangladesh	–	2.98
India	–	0.41
Vietnam	–	1.8
OTHER	China	1.06
OTHER	Indonesia	0.14
OTHER	Philippines	0.87
REST OF THE WORLD	–	9.25

CGIAR Target: 150 million more people, of which 50% are women, without deficiencies in one or more of the following essential micronutrients: iron, zinc, iodine, vitamin A, folate and vitamin B12

CGIAR Target countries	Other Country	Target contribution in country (million people)
Bangladesh	–	3
OTHER	Indonesia	3.9
OTHER	Philippines	1.35

CGIAR Target: 10% reduction in women of reproductive age who are consuming less than the adequate number of food groups

CGIAR Target countries	Other Country	Target contribution in country (%)
Bangladesh	–	3
REST OF THE WORLD	–	3

CGIAR Target: 5% increase in water and nutrient (inorganic, biological) use efficiency in agro-ecosystems, including through recycling and reuse

CGIAR Target countries	Other Country	Target contribution in country (%)
Mali	–	5
Nigeria	–	5
Tanzania	–	5
Bangladesh	–	5
India	–	5
Vietnam	–	5
OTHER	China	5
OTHER	Indonesia	5
OTHER	Philippines	5

CGIAR Target: Reduce agriculturally-related greenhouse gas emissions by 0.2 Gt CO₂-e yr⁻¹ (5%) compared with business-as-usual scenario in 2022

CGIAR Target countries	Other Country	Target contribution in country (Gt CO ₂ -e/yr)
Nigeria	–	0.00005
Bangladesh	–	0.00139
India	–	0.00422
Vietnam	–	0.00169
OTHER	China	0.00784
OTHER	Indonesia	0.00369
OTHER	Philippines	0.00184
REST OF THE WORLD	–	0.00765

Performance Indicator RICE - Table B: Outcomes and outcome costs (total and by source of funding), by flagship project
Costs are total over six years, US\$

PIM TABLE B - RICE Flagship project 1: Accelerating impact and equity

2022 outcome description	Total amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount; \$)	W3 (Amount; \$)	Bilateral (Amount; \$)	Other (Amount; \$)
Foresight analyses and priority setting used by RICE and partner scientists to develop and target technology options	19,000,000	16	50	34	0	3,040,000	9,500,000	6,460,000	0
Improved role in decision making by women and youth in rice value chains as evidenced by empowerment measures at key action sites	17,000,000	16	50	34	0	2,720,000	8,500,000	5,780,000	0
Well functioning multistakeholder platforms for innovation at six action sites (Bangladesh, India, Nepal Nigeria, Senegal, Tanzania)	11,000,000	16	50	34	0	1,760,000	5,500,000	3,740,000	0
New cadre of young, well-trained scientists - 30% women - engaged in rice research	4,000,000	16	50	34	0	640,000	2,000,000	1,360,000	0
Effective public and private delivery systems for seeds of improved rice varieties in six countries (Bangladesh, India, Nepal Nigeria, Senegal, Tanzania)	5,000,000	16	50	34	0	800,000	2,500,000	1,700,000	0
Impacts and adoption of RICE technologies assessed	16,000,000	16	50	34	0	2,560,000	8,000,000	5,440,000	0
Functional and effective results-based management system for RICE and its partners	20,000,000	16	50	34	0	3,200,000	10,000,000	6,800,000	0
	92,000,000					14,720,000	46,000,000	31,280,000	0

PIM TABLE B - RICE Flagship project 2: Upgrading rice value chains

2022 outcome description	Total amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount; \$)	W3 (Amount; \$)	Bilateral (Amount; \$)	Other (Amount; \$)
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Diversified enterprise opportunities through upgraded value chains at six action sites (Indonesia, Myanmar, Vietnam Cote d'Ivoire, Nigeria, Tanzania)	10,200,000	36	30	34	0	3,672,000	3,060,000	3,468,000	0
Income by value-chain actors increased by 10% at six action sites through improved access to financial and other services (Indonesia, Myanmar, Vietnam Cote d'Ivoire, Nigeria, Tanzania)	1,600,000	36	30	34	0	576,000	480,000	544,000	0
Income by value-chain actors increased by 15% through adoption of at least one of the postharvest or value addition practices or technologies at six action sites (Bangladesh, Cambodia, Indonesia Benin, Cote d'Ivoire, Nigeria)	3,100,000	36	30	34	0	1,116,000	930,000	1,054,000	0
Functional value chains for improved processing and novel products from rice at six action sites (Bangladesh, Cambodia, Indonesia Benin, Cote d'Ivoire, Nigeria)	5,200,000	36	30	34	0	1,872,000	1,560,000	1,768,000	0
Capacity development needs among partner research organizations along the rice value chain identified	2,300,000	36	30	34	0	828,000	690,000	782,000	0
	22,400,000					8,064,000	6,720,000	7,616,000	0

PIM TABLE B - RICE Flagship project 3: Sustainable farming systems

2022 outcome description	Total amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount; \$)	W3 (Amount; \$)	Bilateral (Amount; \$)	Other (Amount; \$)
Results of completed farming systems analyses used to focus development activities on key opportunities for adapting to climate risks at eight action sites (Nigeria, Senegal, Tanzania, Madagascar, Vietnam, Indonesia, Bangladesh, Myanmar)	10,000,000	13	20	67	0	1,300,000	2,000,000	6,700,000	0

Improved management practices that reduce yield gap by 10-15% developed and disseminated at eight action sites (Nigeria, Senegal, Tanzania, Madagascar, Vietnam, Indonesia, Bangladesh, Myanmar)	15,000,000	13	20	67	0	1,950,000	3,000,000	10,050,000	0
Improved management practices that increase input use efficiency by 5% developed and disseminated at eight action sites (Nigeria, Senegal, Tanzania, Madagascar, Vietnam, Indonesia, Bangladesh, Myanmar)	15,000,000	13	20	67	0	1,950,000	3,000,000	10,050,000	0
Value chain actors including farmers and service providers using new mechanization options designed to increase women's labor productivity at seven action sites (Nigeria, Senegal, Tanzania, Vietnam, Indonesia, Bangladesh, Myanmar)	6,500,000	13	20	67	0	845,000	1,300,000	4,355,000	0
Improved rice management practices that reduce GHG by 5% disseminated at three action sites (Bangladesh, Philippines, Vietnam)	7,000,000	13	20	67	0	910,000	1,400,000	4,690,000	0
Options to diversify rice farms with other crops, animals, or trees developed and disseminated at six action sites (Cote d'Ivoire, Madagascar, Tanzania, India, Bangladesh, Myanmar) (together with other CRPs)	52,000,000	13	20	67	0	6,760,000	10,400,000	34,840,000	0
Diversified on-farm diets sourced through diversified farming systems at four action sites (Cote d'Ivoire, Madagascar, Bangladesh, Myanmar) (together with other CRPs)	17,000,000	13	20	67	0	2,210,000	3,400,000	11,390,000	0
Increased capacity for innovation on sustainable farming systems in partner research organizations	21,600,000	13	20	67	0	2,808,000	4,320,000	14,472,000	0
	144,100,000					18,733,000	28,820,000	96,547,000	0

PIM TABLE B - RICE Flagship project 4: Global Rice Array

2022 outcome description	Total amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount; \$)	W3 (Amount; \$)	Bilateral (Amount; \$)	Other (Amount; \$)
Predicted global rice production risks used to guide development and targeting of climate change-adapted technologies at least for the most vulnerable rice agroecosystems	9,000,000	30	48	22	0	2,700,000	4,320,000	1,980,000	0
A functional global phenotyping network composed to 30% by non-CRP partners (including self-sponsored), and genetic donors (>10) and ideotypes (2-4) adopted by breeding programs to develop climate-smart rice varieties	19,200,000	30	48	22	0	5,760,000	9,216,000	4,224,000	0
Characterized pathogens populations and diversity used to predict varietal deployment for at least 3 major rice diseases	20,700,000	30	48	22	0	6,210,000	9,936,000	4,554,000	0
At least 5 major QTLs/genes that are stable across environment and management, for all four mega rice environments, are integrated in the respective varietal development pipelines	8,700,000	30	48	22	0	2,610,000	4,176,000	1,914,000	0
A functional rice data hub providing open access phenotypic and genotypic information and data analysis tools to global users	7,900,000	30	48	22	0	2,370,000	3,792,000	1,738,000	0
Increased capacity for innovation in pre-breeding and Big Data in partner research organizations	3,400,000	30	48	22	0	1,020,000	1,632,000	748,000	0
	68,900,000					20,670,000	33,072,000	15,158,000	0

PIM TABLE B - RICE Flagship project 5: New rice varieties

2022 outcome description	Total amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount; \$)	W3 (Amount; \$)	Bilateral (Amount; \$)	Other (Amount; \$)
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Rice diversity in rice gene banks used globally for identification of traits and discovery of new genes	19,500,000	16	64	20	0	3,120,000	12,480,000	3,900,000	0
Novel tools for precision biotech breeding based on genetic diversity shared open access and globally	32,900,000	16	64	20	0	5,264,000	21,056,000	6,580,000	0
New rice varieties resulting in 1.3 % genetic gain in intensive systems	39,300,000	16	64	20	0	6,288,000	25,152,000	7,860,000	0
Rice varieties with 20, 15, 10% reduction in yield loss caused by factors induced by climate change, in mega deltas, rainfed lowlands, and uplands, respectively	40,800,000	16	64	20	0	6,528,000	26,112,000	8,160,000	0
High quality and high nutritious rice varieties that are preferred by men and women farmers and consumers	6,500,000	16	64	20	0	1,040,000	4,160,000	1,300,000	0
Prototype C4 rice lines with increased yield potential available	3,200,000	16	64	20	0	512,000	2,048,000	640,000	0
Increased capacity on modern rice breeding technologies in partner research organizations	25,000,000	16	64	20	0	4,000,000	16,000,000	5,000,000	0
	167,200,000					26,752,000	107,008,000	33,440,000	0

Performance Indicator RICE - Table C: Sub-IDOs and their costs (total and by source of funding), by flagship project
Costs are total over six years, US\$

PIM TABLE C - RICE Flagship project 1: Accelerating impact and equity

Sub-IDO	Total amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount; \$)	W3 (Amount; \$)	Bilateral (Amount; \$)	Other (Amount; \$)
Increased capacity for innovation in partner research organizations	39,000,000	16	50	34	0	6,240,000	19,500,000	13,260,000	0
Improved capacity of women and young people to participate in decision-making	17,000,000	16	50	34	0	2,720,000	8,500,000	5,780,000	0
Increased capacity for innovation in partner development organizations and in poor and vulnerable communities	11,000,000	16	50	34	0	1,760,000	5,500,000	3,740,000	0
Enhanced individual capacity in partner research organizations through training and exchange	4,000,000	16	50	34	0	640,000	2,000,000	1,360,000	0
Increased capacity of beneficiaries to adopt research outputs	21,000,000	16	50	34	0	3,360,000	10,500,000	7,140,000	0
	92,000,000					14,720,000	46,000,000	31,280,000	0

PIM TABLE C - RICE Flagship project 2: Upgrading rice value chains

Sub-IDO	Total amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount; \$)	W3 (Amount; \$)	Bilateral (Amount; \$)	Other (Amount; \$)
Diversified enterprise opportunities	10,200,000	36	30	34	0	3,672,000	3,060,000	3,468,000	0
Improved access to financial and other services	1,600,000	36	30	34	0	576,000	480,000	544,000	0
Reduced pre and post harvest losses, incl. climate change	3,100,000	36	30	34	0	1,116,000	930,000	1,054,000	0
Increased value capture by producers	5,200,000	36	30	34	0	1,872,000	1,560,000	1,768,000	0
Increased capacity for innovation in partner research organizations	2,300,000	36	30	34	0	828,000	690,000	782,000	0
	22,400,000					8,064,000	6,720,000	7,616,000	0

PIM TABLE C - RICE Flagship project 3: Sustainable farming systems

Sub-IDO	Total amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount; \$)	W3 (Amount; \$)	Bilateral (Amount; \$)	Other (Amount; \$)
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Enhanced capacity to deal with climatic risks and extremes	10,000,000	13	20	67	0	1,300,000	2,000,000	6,700,000	0
Closed yield gaps through improved agronomic and animal husbandry practices	15,000,000	13	20	67	0	1,950,000	3,000,000	10,050,000	0
More efficient use of inputs	15,000,000	13	20	67	0	1,950,000	3,000,000	10,050,000	0
Technologies that reduce women's labor and energy expenditure developed and disseminated	6,500,000	13	20	67	0	845,000	1,300,000	4,355,000	0
Reduced net greenhouse gas emissions from agriculture, forests and other forms of land use	7,000,000	13	20	67	0	910,000	1,400,000	4,690,000	0
Increased livelihood opportunities	52,000,000	13	20	67	0	6,760,000	10,400,000	34,840,000	0
Increased access to diverse nutrient-rich foods	17,000,000	13	20	67	0	2,210,000	3,400,000	11,390,000	0
Increased capacity for innovation in partner research organizations	21,600,000	13	20	67	0	2,808,000	4,320,000	14,472,000	0
	144,100,000					18,733,000	28,820,000	96,547,000	0

PIM TABLE C - RICE Flagship project 4: Global Rice Array

Sub-IDO	Total amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount; \$)	W3 (Amount; \$)	Bilateral (Amount; \$)	Other (Amount; \$)
Enhanced capacity to deal with climatic risks and extremes	29,700,000	30	48	22	0	8,910,000	14,256,000	6,534,000	0
Enhanced genetic gains	28,000,000	30	48	22	0	8,400,000	13,440,000	6,160,000	0
Increased conservation and use of genetic resources	7,800,000	30	48	22	0	2,340,000	3,744,000	1,716,000	0
Increased capacity for innovation in partner research organizations	3,400,000	30	48	22	0	1,020,000	1,632,000	748,000	0
	68,900,000					20,670,000	33,072,000	15,158,000	0

PIM TABLE C - RICE Flagship project 5: New rice varieties

Sub-IDO	Total amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount; \$)	W3 (Amount; \$)	Bilateral (Amount; \$)	Other (Amount; \$)
Increased conservation and use of genetic resources	55,600,000	16	64	20	0	8,896,000	35,584,000	11,120,000	0
Enhanced genetic gains	39,300,000	16	64	20	0	6,288,000	25,152,000	7,860,000	0

Enhanced adaptive capacity to climate risks	40,800,000	16	64	20	0	6,528,000	26,112,000	8,160,000	0
Increased access to diverse nutrient-rich foods	6,500,000	16	64	20	0	1,040,000	4,160,000	1,300,000	0
Increased capacity for innovation in partner research organizations	25,000,000	16	64	20	0	4,000,000	16,000,000	5,000,000	0
	167,200,000					26,752,000	107,008,000	33,440,000	0

Performance Indicator RICE - Table D: Milestones, by flagship project

PIM TABLE D - RICE Flagship project 1: Accelerating impact and equity

Year	Milestone description	Means of verifying	For which outcomes
2017	Updated rice supply-demand scenario analyses, horizon scanning, and target domains for RICE technologies identified or refined (rolling plan)	Reports, targets domain maps, RICE Management Information System updates	Foresight analyses and priority setting used by RICE and partner scientists to develop and target technology options
2019	Updated rice supply-demand scenario analyses, horizon scanning, and target domains for RICE technologies identified or refined (rolling plan)	Reports, targets domain maps, RICE Management Information System updates	Foresight analyses and priority setting used by RICE and partner scientists to develop and target technology options
2021	Updated rice supply-demand scenario analyses, horizon scanning, and target domains for RICE technologies identified or refined (rolling plan)	Reports, targets domain maps, RICE Management Information System updates	Foresight analyses and priority setting used by RICE and partner scientists to develop and target technology options
2017	Measures of women empowerment quantified using RICE baseline data at key action sites study on youth's role in decision making initiated	Women empowerment indicators in RICE Management Information System case stories reports	Improved role in decision making by women and youth in rice value chains as evidenced by empowerment measures at key action sites
2019	Piloting innovative business models on emerging opportunities for women and youth in the rice sector in selected countries in two countries in Asia and Africa each.	Women empowerment indicators in RICE Management Information System case stories reports	Improved role in decision making by women and youth in rice value chains as evidenced by empowerment measures at key action sites
2021	Evaluation of the changes in women's and youth's role in decision making conducted, and feedback provided to project leaders, national partners and donors.	Women empowerment indicators in RICE Management Information System case stories reports	Improved role in decision making by women and youth in rice value chains as evidenced by empowerment measures at key action sites
2017	10% of key regions have at least one functional multistakeholder platform at key action sites	Reports, RICE Management Information System indicators,	Well functioning multistakeholder platforms for innovation at six action sites (Bangladesh, India, Nepal Nigeria, Senegal, Tanzania)
2019	50% of key regions have at least one functional multistakeholder platform at key action sites	Reports, RICE Management Information System indicators,	Well functioning multistakeholder platforms for innovation at six action sites (Bangladesh, India, Nepal Nigeria, Senegal, Tanzania)
2021	100% of key regions have at least one functional multistakeholder platform at key action sites	Reports, RICE Management Information System indicators,	Well functioning multistakeholder platforms for innovation at six action sites (Bangladesh, India, Nepal Nigeria, Senegal, Tanzania)
2017	250-300 scholars (30% women) enrolled in advanced degree training (bachelors, masters, PhD)	Training center statistics	New cadre of young, well-trained scientists - 30% women - engaged in rice research
2018	250-300 scholars (30% women) enrolled in advanced degree training (bachelors, masters, PhD)	Training center statistics	New cadre of young, well-trained scientists - 30% women - engaged in rice research
2019	250-300 scholars (30% women) enrolled in advanced degree training (bachelors, masters, PhD)	Training center statistics	New cadre of young, well-trained scientists - 30% women - engaged in rice research
2020	250-300 scholars (30% women) enrolled in advanced degree training (bachelors, masters, PhD)	Training center statistics	New cadre of young, well-trained scientists - 30% women - engaged in rice research
2021	250-300 scholars (30% women) enrolled in advanced degree training (bachelors, masters, PhD)	Training center statistics	New cadre of young, well-trained scientists - 30% women - engaged in rice research

2022	250-300 scholars (30% women) enrolled in advanced degree training (bachelors, masters, PhD)	Training center statistics	New cadre of young, well-trained scientists - 30% women - engaged in rice research
2018	Sufficient commercial seed produced by the seed system to provide seeds for at least 5 million farmers, of which at least 50% are women, at the key action sites	Bilateral project reports, STRASA, GSR, others RICE Management Information System indicators	Effective public and private delivery systems for seeds of improved rice varieties in six countries (Bangladesh, India, Nepal Nigeria, Senegal, Tanzania)
2020	Sufficient commercial seed produced by the seed system to provide seeds for at least 15 million farmers, of which at least 50% are women, at the key action sites	Bilateral project reports, STRASA, GSR, others RICE Management Information System indicators	Effective public and private delivery systems for seeds of improved rice varieties in six countries (Bangladesh, India, Nepal Nigeria, Senegal, Tanzania)
2022	Seed of improved varieties reached at least 20 million farmers, of which at least 50% are women, at the key action sites	Bilateral project reports, STRASA, GSR, others RICE Management Information System indicators	Effective public and private delivery systems for seeds of improved rice varieties in six countries (Bangladesh, India, Nepal Nigeria, Senegal, Tanzania)
2017	Adoption and impact studies on NRM technologies and/or varieties - rolling plan based on progress of technologies along the impact pathway	reports RICE Management Information System updates	Impacts and adoption of RICE technologies assessed
2018	Adoption and impact studies on NRM technologies and/or varieties - rolling plan based on progress of technologies along the impact pathway	reports RICE Management Information System updates	Impacts and adoption of RICE technologies assessed
2019	Adoption and impact studies on NRM technologies and/or varieties - rolling plan based on progress of technologies along the impact pathway	reports RICE Management Information System updates	Impacts and adoption of RICE technologies assessed
2020	Adoption and impact studies on NRM technologies and/or varieties - rolling plan based on progress of technologies along the impact pathway	reports RICE Management Information System updates	Impacts and adoption of RICE technologies assessed
2021	Adoption and impact studies on NRM technologies and/or varieties - rolling plan based on progress of technologies along the impact pathway	reports RICE Management Information System updates	Impacts and adoption of RICE technologies assessed
2022	Adoption and impact studies on NRM technologies and/or varieties - rolling plan based on progress of technologies along the impact pathway	reports RICE Management Information System updates	Impacts and adoption of RICE technologies assessed
2017	Annual updates of progress and performance indicators reflective learning workshops commissioned reviews and evaluations (rolling plan)	reports RICE Management Information System updates	Functional and effective results-based management system for RICE and its partners
2018	Annual updates of progress and performance indicators reflective learning workshops commissioned reviews and evaluations (rolling plan)	reports RICE Management Information System updates	Functional and effective results-based management system for RICE and its partners
2019	Annual updates of progress and performance indicators reflective learning workshops commissioned reviews and evaluations (rolling plan)	reports RICE Management Information System updates	Functional and effective results-based management system for RICE and its partners
2020	Annual updates of progress and performance indicators reflective learning workshops commissioned reviews and evaluations (rolling plan)	reports RICE Management Information System updates	Functional and effective results-based management system for RICE and its partners

2021	Annual updates of progress and performance indicators reflective learning workshops commissioned reviews and evaluations (rolling plan)	reports RICE Management Information System updates	Functional and effective results-based management system for RICE and its partners
2022	Annual updates of progress and performance indicators reflective learning workshops commissioned reviews and evaluations (rolling plan)	reports RICE Management Information System updates	Functional and effective results-based management system for RICE and its partners

PIM TABLE D - RICE Flagship project 2: Upgrading rice value chains

Year	Milestone description	Means of verifying	For which outcomes
2018	Upgrading strategies developed with partners for increasing value capture by actors in three action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators	Diversified enterprise opportunities through upgraded value chains at six action sites (Indonesia, Myanmar, Vietnam Cote d'Ivoire, Nigeria, Tanzania)
2019	Upgrading strategies piloted with partners for verification in three action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators	Diversified enterprise opportunities through upgraded value chains at six action sites (Indonesia, Myanmar, Vietnam Cote d'Ivoire, Nigeria, Tanzania)
2021	Value chains upgraded at three action sites upgrading strategy expanded with lessons captured in three additional action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators	Diversified enterprise opportunities through upgraded value chains at six action sites (Indonesia, Myanmar, Vietnam Cote d'Ivoire, Nigeria, Tanzania)
2017	Existing value chain services, finance options, and constraints identified at six action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators	Income by value-chain actors increased by 10% at six action sites through improved access to financial and other services (Indonesia, Myanmar, Vietnam Cote d'Ivoire, Nigeria, Tanzania)
2020	In-country partners developed program for out-scaling value chain services and engaged in policy dialog for improving access to finance.	Reports, case study documentation, significant change stories, RICE Management Information System indicators	Income by value-chain actors increased by 10% at six action sites through improved access to financial and other services (Indonesia, Myanmar, Vietnam Cote d'Ivoire, Nigeria, Tanzania)
2022	Income by value-chain actors increased by 10% at six action sites because of increased value chain services	Reports, case study documentation, significant change stories, RICE Management Information System indicators	Income by value-chain actors increased by 10% at six action sites through improved access to financial and other services (Indonesia, Myanmar, Vietnam Cote d'Ivoire, Nigeria, Tanzania)
2017	Baseline surveys conducted and entry points for loss reduction/value addition identified	Reports, case study documentation, significant change stories, RICE Management Information System indicators	Income by value-chain actors increased by 15% through adoption of at least one of the postharvest or value addition practices or technologies at six action sites (Bangladesh, Cambodia, Indonesia Benin, Cote d'Ivoire, Nigeria)
2018	At least two loss reduction or value addition options identified and piloted	Reports, case study documentation, significant change stories, RICE Management Information System indicators	Income by value-chain actors increased by 15% through adoption of at least one of the postharvest or value addition practices or technologies at six action sites (Bangladesh, Cambodia, Indonesia Benin, Cote d'Ivoire, Nigeria)
2020	At least two additional loss reduction or value addition options identified and piloted	Reports, case study documentation, significant change stories, RICE Management Information System indicators	Income by value-chain actors increased by 15% through adoption of at least one of the postharvest or value addition practices or technologies at six action sites (Bangladesh, Cambodia, Indonesia Benin, Cote d'Ivoire, Nigeria)

2022	Pilot users at six action sites increase income from rice by 15% through adoption of at least one of the postharvest or value addition practices or technologies	Reports, case study documentation, significant change stories, RICE Management Information System indicators	Income by value-chain actors increased by 15% through adoption of at least one of the postharvest or value addition practices or technologies at six action sites (Bangladesh, Cambodia, Indonesia Benin, Cote d'Ivoire, Nigeria)
2018	Prototype improved processing and novel products developed and tested at six action sites	Existence of new products and processing technologies, Reports, case study documentation, significant change stories, RICE Management Information System indicators	Functional value chains for improved processing and novel products from rice at six action sites (Bangladesh, Cambodia, Indonesia Benin, Cote d'Ivoire, Nigeria)
2021	Farm-to-market strategies for improved processing and novel rice products at six action sites	Existence of new products and processing technologies, Reports, case study documentation, significant change stories, RICE Management Information System indicators	Functional value chains for improved processing and novel products from rice at six action sites (Bangladesh, Cambodia, Indonesia Benin, Cote d'Ivoire, Nigeria)
2017	Capacity development needs among partner research organizations along the rice value chain identified	Reports, research projects at partner research organizations, RICE Management Information System updates	Capacity development needs among partner research organizations along the rice value chain identified
2019	Research initiatives with evidence of direct response to demand of stakeholders along the rice value chain at six action sites	Reports, research projects at partner research organizations, RICE Management Information System updates	Capacity development needs among partner research organizations along the rice value chain identified
2021	Local research innovations to strengthen rice value chains, reduce losses, and/or improve processing and marketing at six action sites	Reports, research projects at partner research organizations, RICE Management Information System updates	Capacity development needs among partner research organizations along the rice value chain identified

PIM TABLE D - RICE Flagship project 3: Sustainable farming systems

Year	Milestone description	Means of verifying	For which outcomes
2017	Farming systems analyses platform established within RICE and with other CRPs at eight key action sites	Reports, case study documentation, RICE Management Information System indicators, management option dissemination materials	Results of completed farming systems analyses used to focus development activities on key opportunities for adapting to climate risks at eight action sites (Nigeria, Senegal, Tanzania, Madagascar, Vietnam, Indonesia, Bangladesh, Myanmar)
2019	Integration of options for reducing risks caused by climate risks communicated to national policy framework (with FP1)	Reports, case study documentation, RICE Management Information System indicators, management option dissemination materials	Results of completed farming systems analyses used to focus development activities on key opportunities for adapting to climate risks at eight action sites (Nigeria, Senegal, Tanzania, Madagascar, Vietnam, Indonesia, Bangladesh, Myanmar)
2017	Baseline rice yield gap quantified, and constraints and opportunities identified at eight key action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Improved management practices that reduce yield gap by 10-15% developed and disseminated at eight action sites (Nigeria, Senegal, Tanzania, Madagascar, Vietnam, Indonesia, Bangladesh, Myanmar)
2020	Demonstration farmers (30-40% women) reduce rice yield gaps by 10-15% at eight action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Improved management practices that reduce yield gap by 10-15% developed and disseminated at eight action sites (Nigeria, Senegal, Tanzania, Madagascar, Vietnam, Indonesia, Bangladesh, Myanmar)
2022	Top 10% farmers farmers (30-40% women) reduce rice yield gaps by 10-15% at eight action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Improved management practices that reduce yield gap by 10-15% developed and disseminated at eight action sites (Nigeria, Senegal, Tanzania, Madagascar, Vietnam, Indonesia, Bangladesh, Myanmar)

2018	Baseline input use efficiencies quantified, and constraints and opportunities identified at eight action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Improved management practices that increase input use efficiency by 5% developed and disseminated at eight action sites (Nigeria, Senegal, Tanzania, Madagascar, Vietnam, Indonesia, Bangladesh, Myanmar)
2020	Demonstration farmers (30-40% women) increase input use efficiencies by 5% at eight action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Improved management practices that increase input use efficiency by 5% developed and disseminated at eight action sites (Nigeria, Senegal, Tanzania, Madagascar, Vietnam, Indonesia, Bangladesh, Myanmar)
2022	Top 10% farmers (30-40% women) increase input use efficiencies by 5% at eight action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Improved management practices that increase input use efficiency by 5% developed and disseminated at eight action sites (Nigeria, Senegal, Tanzania, Madagascar, Vietnam, Indonesia, Bangladesh, Myanmar)
2017	Benchmark indicators established for women farmers' labor use at seven key action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Value chain actors including farmers and service providers using new mechanization options designed to increase women's labor productivity at seven action sites (Nigeria, Senegal, Tanzania, Vietnam, Indonesia, Bangladesh, Myanmar)
2019	Prototype labor-saving technologies for crop establishment and weeding, harvesting, and threshing introduced for testing at seven action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Value chain actors including farmers and service providers using new mechanization options designed to increase women's labor productivity at seven action sites (Nigeria, Senegal, Tanzania, Vietnam, Indonesia, Bangladesh, Myanmar)
2021	Unintended consequences of labor displacement of the women and poor assessed, and strategies developed to assist women with more remunerative use of their labor	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Value chain actors including farmers and service providers using new mechanization options designed to increase women's labor productivity at seven action sites (Nigeria, Senegal, Tanzania, Vietnam, Indonesia, Bangladesh, Myanmar)
2022	Top 10% female farmers/service providers adopt labor-saving technologies positive benefits to women farmers and women laborers at seven action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Value chain actors including farmers and service providers using new mechanization options designed to increase women's labor productivity at seven action sites (Nigeria, Senegal, Tanzania, Vietnam, Indonesia, Bangladesh, Myanmar)
2017	GHG emissions and carbon capture benchmarked at three action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Improved rice management practices that reduce GHG by 5% disseminated at three action sites (Bangladesh, Philippines, Vietnam)
2019	Demonstration farmers reduce GHG emission by 10-30% at three action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Improved rice management practices that reduce GHG by 5% disseminated at three action sites (Bangladesh, Philippines, Vietnam)
2021	Management practices to reduce GHG emissions tested at climate-smart villages through CCAFS, and scaled out through CCAFS networks	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Improved rice management practices that reduce GHG by 5% disseminated at three action sites (Bangladesh, Philippines, Vietnam)

2022	Functional outscaling networks and policy support for rice management practices that reduce GHG emissions in SE Asia (through CCAFS collaboration)	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Improved rice management practices that reduce GHG by 5% disseminated at three action sites (Bangladesh, Philippines, Vietnam)
2017	Baseline farming system description completed at six action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Options to diversity rice farms with other crops, animals, or trees developed and disseminated at six action sites (Cote d'Ivoire, Madagascar, Tanzania, India, Bangladesh, Myanmar) (together with other CRPs)
2018	options for farm diversification developed and tested at six action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Options to diversity rice farms with other crops, animals, or trees developed and disseminated at six action sites (Cote d'Ivoire, Madagascar, Tanzania, India, Bangladesh, Myanmar) (together with other CRPs)
2020	Demonstration farmers (30-40% women) realize 15% increase in farm-derived income through diversification at six key action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Options to diversity rice farms with other crops, animals, or trees developed and disseminated at six action sites (Cote d'Ivoire, Madagascar, Tanzania, India, Bangladesh, Myanmar) (together with other CRPs)
2022	Top 10% farmers (30-40% women) realize 15% increase in farm-derived income through diversification at six action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Options to diversity rice farms with other crops, animals, or trees developed and disseminated at six action sites (Cote d'Ivoire, Madagascar, Tanzania, India, Bangladesh, Myanmar) (together with other CRPs)
2018	Baseline on-farm diets characterized at four action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Diversified on-farm diets sourced through diversified farming systems at four action sites (Cote d'Ivoire, Madagascar, Bangladesh, Myanmar) (together with other CRPs)
2021	Impact of farm diversification on on-farm diets established at four action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Diversified on-farm diets sourced through diversified farming systems at four action sites (Cote d'Ivoire, Madagascar, Bangladesh, Myanmar) (together with other CRPs)
2022	Farmers (30-40% women) adopting diversified farming systems have diversified diets at four action sites	Reports, case study documentation, significant change stories, RICE Management Information System indicators, management option dissemination materials	Diversified on-farm diets sourced through diversified farming systems at four action sites (Cote d'Ivoire, Madagascar, Bangladesh, Myanmar) (together with other CRPs)
2017	Capacity development needs on sustainable farming systems identified among partner research organizations	Reports, research projects at partner research organizations, RICE Management Information System updates	Increased capacity for innovation on sustainable farming systems in partner research organizations
2019	Research initiatives on sustainable farming systems with evidence of direct response to demand of stakeholders	Reports, research projects at partner research organizations, RICE Management Information System updates	Increased capacity for innovation on sustainable farming systems in partner research organizations
2021	Local research innovations on sustainable farming systems at six action sites	Reports, research projects at partner research organizations, RICE Management Information System updates	Increased capacity for innovation on sustainable farming systems in partner research organizations

PIM TABLE D - RICE Flagship project 4: Global Rice Array

Year	Milestone description	Means of verifying	For which outcomes
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2017	Global array delimited, baseline information including gender mapping (FP1) and historic climate and crop performance data gathered for crop-model assisted constraint mapping (current scenario)	Existence of rice array sites, data in open acces data bases, reports, RICE Management Information System indicators	Predicted global rice production risks used to guide development and targeting of climate change-adapted technologies at least for the most vulnerable rice agroecosystems
2018	Global array refined based on preliminary results to capture major TPEs (target populations of environments of breeding programs) and major climate trend scenarios	Existence of rice array sites, data in open acces data bases, reports, RICE Management Information System indicators	Predicted global rice production risks used to guide development and targeting of climate change-adapted technologies at least for the most vulnerable rice agroecosystems
2019	Antenna experiments have generated quality data (enviroment and crop) from at least 80% of the global array sites	Existence of rice array sites, data in open acces data bases, reports, RICE Management Information System indicators	Predicted global rice production risks used to guide development and targeting of climate change-adapted technologies at least for the most vulnerable rice agroecosystems
2020	Model(s) calibrated using antenna data and used to explain yield variation caused by biotic and abiotic factors	Existence of rice array sites, data in open acces data bases, reports, RICE Management Information System indicators	Predicted global rice production risks used to guide development and targeting of climate change-adapted technologies at least for the most vulnerable rice agroecosystems
2021	Rice production risks predicted for each major TPE of the global array and priorities for technologies deployment recommended at regional/country level	Existence of rice array sites, data in open acces data bases, reports, RICE Management Information System indicators	Predicted global rice production risks used to guide development and targeting of climate change-adapted technologies at least for the most vulnerable rice agroecosystems
2017	Existing HTP field-based and specialized platforms upgraded and 60% of phenotyping sites managed by NARS identified	Existence of phenotyping platforms, phenotype-genotype data in open acces data bases, reports, RICE Management Information System indicators	A functional global phenotyping network composed to 30% by non-CRP partners (including self-sponsored), and genetic donors (>10) and ideotypes (2-4) adopted by breeding programs to develop climate-smart rice varieties
2018	(i) Phenotyping facilities and network up and running in at least 60% of the target sites, (ii) new HTP platforms established at Mbã© (HTP field-based), CIAT PALMIRA, and IRRI, (iii) Efficient reporting (data acquisition, quality control, annual reports, etc.) mechanisms/tools are in place	Existence of phenotyping platforms, phenotype-genotype data in open acces data bases, reports, RICE Management Information System indicators	A functional global phenotyping network composed to 30% by non-CRP partners (including self-sponsored), and genetic donors (>10) and ideotypes (2-4) adopted by breeding programs to develop climate-smart rice varieties
2019	Phenotyping facilities and network up and running in all initial target sites and new partners interested in	Existence of phenotyping platforms, phenotype-genotype data in open acces data bases, reports, RICE Management Information System indicators	A functional global phenotyping network composed to 30% by non-CRP partners (including self-sponsored), and genetic donors (>10) and ideotypes (2-4) adopted by breeding programs to develop climate-smart rice varieties
2021	Resilient genotypes identified Ideotypes adapted to future climate scenarios and different GxExM scenarios validated	Existence of phenotyping platforms, phenotype-genotype data in open acces data bases, reports, RICE Management Information System indicators	A functional global phenotyping network composed to 30% by non-CRP partners (including self-sponsored), and genetic donors (>10) and ideotypes (2-4) adopted by breeding programs to develop climate-smart rice varieties

2022	Global phenotyping data curated and made available to global community through the integrative rice data hub (CoA 4.5)	Existence of phenotyping platforms, phenotype-genotype data in open access data bases, reports, RICE Management Information System indicators	A functional global phenotyping network composed to 30% by non-CRP partners (including self-sponsored), and genetic donors (>10) and ideotypes (2-4) adopted by breeding programs to develop climate-smart rice varieties
2018	Spatial distribution of pests and diseases and deployment of available isolines completed in at least 60% of the target sites	Existence of trials, reports, management options communicated in various (E) outlets	Characterized pathogens populations and diversity used to predict varietal deployment for at least 3 major rice diseases
2019	Field diagnostic tools developed for epidemiology surveys	Existence of trials, reports, management options communicated in various (E) outlets	Characterized pathogens populations and diversity used to predict varietal deployment for at least 3 major rice diseases
2020	(i) Rice/soil microbiome interaction characterized and beneficial microorganisms identified (ii) Efficiency of available disease resistance genes validated	Existence of trials, reports, management options communicated in various (E) outlets	Characterized pathogens populations and diversity used to predict varietal deployment for at least 3 major rice diseases
2022	Integrated pest and diseases management options including the use of beneficial microorganisms in relevant ecologies formulated	Existence of trials, reports, management options communicated in various (E) outlets	Characterized pathogens populations and diversity used to predict varietal deployment for at least 3 major rice diseases
2017	Genomic information baseline obtained for populations to be phenotyped in CoA 4.2	Publications, reports, open access data bases (eg SNP Seek)	At least 5 major QTLs/genes that are stable across environment and management, for all four mega rice environments, are integrated in the respective varietal development pipelines
2020	Contribution of G, E and M to QTL/gene effect determined	Publications, reports, open access data bases (eg SNP Seek)	At least 5 major QTLs/genes that are stable across environment and management, for all four mega rice environments, are integrated in the respective varietal development pipelines
2021	Candidate genes identified and QTL/genes and donors validated across E and M	Publications, reports, open access data bases (eg SNP Seek)	At least 5 major QTLs/genes that are stable across environment and management, for all four mega rice environments, are integrated in the respective varietal development pipelines
2022	At least 5 major QTLs/genes stable across E and M for each of the 4 ecologies integrated in the respective varietal development pipelines	Publications, reports, open access data bases (eg SNP Seek)	At least 5 major QTLs/genes that are stable across environment and management, for all four mega rice environments, are integrated in the respective varietal development pipelines
2019	Development of the rice data hub completed for data curation and integration modules (at least version 1)	Publications, reports, open access data bases (eg SNP Seek)	A functional rice data hub providing open access phenotypic and genotypic information and data analysis tools to global users
2020	Semantic rice knowledge network established (at least version 1)	Publications, reports, open access data bases (eg SNP Seek)	A functional rice data hub providing open access phenotypic and genotypic information and data analysis tools to global users
2021	Integrated analytical tools to enable predictive and decision-making processes.	Publications, reports, open access data bases (eg SNP Seek)	A functional rice data hub providing open access phenotypic and genotypic information and data analysis tools to global users

2022	Integrative rice data hub with completely curated datasets accessible to global community	Publications, reports, open access data bases (eg SNP Seek)	A functional rice data hub providing open access phenotypic and genotypic information and data analysis tools to global users
2017	Capacity development needs in pre-breeding and Big Data identified among partner research organizations	Reports, research projects at partner research organizations, RICE Management Information System updates	Increased capacity for innovation in pre-breeding and Big Data in partner research organizations
2019	Research initiatives in multi-environment pre-breeding and Big Data feeding into rice breeding pipelines	Reports, research projects at partner research organizations, RICE Management Information System updates	Increased capacity for innovation in pre-breeding and Big Data in partner research organizations
2021	Local novel rice populations and lines based on multi-environment big data data collection and analysis	Reports, research projects at partner research organizations, RICE Management Information System updates	Increased capacity for innovation in pre-breeding and Big Data in partner research organizations

PIM TABLE D - RICE Flagship project 5: New rice varieties

Year	Milestone description	Means of verifying	For which outcomes
2017	5-10 donors/genes achieved from GRiSP in use by breeding programs screening of 100 accessions from 3 K panel each year to identify donors/gene/QTLs for trait biology (biotic, abiotic) initiated, diversity analysis and system biology research initiated	Genes, markers etc described in publications and reports, open access data bases (eg SNP Seek)	Rice diversity in rice gene banks used globally for identification of traits and discovery of new genes
2018	20% of targeted traits/donors/QTLs/genes identification achieved,	Genes, markers etc described in publications and reports, open access data bases (eg SNP Seek)	Rice diversity in rice gene banks used globally for identification of traits and discovery of new genes
2020	60% of targeted traits/donors/QTLs/genes identification achieved, diversity analy	Genes, markers etc described in publications and reports, open access data bases (eg SNP Seek)	Rice diversity in rice gene banks used globally for identification of traits and discovery of new genes
2022	100% of targeted traits/donors/QTLs/genes identification achieved	Genes, markers etc described in publications and reports, open access data bases (eg SNP Seek)	Rice diversity in rice gene banks used globally for identification of traits and discovery of new genes
2017	Based on GRiSP results, analysed and identified new breeding tools and resources for precision breeding, gene editing, genomic selection, breeding simulations, candidate genes (20), markers (16), reference panels (4)	Tools described in publications and reports, available online, documented use in reports	Novel tools for precision biotech breeding based on genetic diversity shared open access and globally
2020	50% of the targeted breeding tools and resources developed and used in breeding programs	Tools described in publications and reports, available online, documented use in reports	Novel tools for precision biotech breeding based on genetic diversity shared open access and globally
2022	100% of the targeted breeding tools and resources developed and used in breeding programs	Tools described in publications and reports, available online, documented use in reports	Novel tools for precision biotech breeding based on genetic diversity shared open access and globally
2017	Upgraded breeding programs, and 10-20 lines from GRiSP with 5-10% higher yield nominated for release	Existence of lines and new varieties, line development and variety release tracking in RICE Management Information System	New rice varieties resulting in 1.3 % genetic gain in intensive systems
2019	60 lines nominated for release with 15% higher yield and meeting national quality requirements,	Existence of lines and new varieties, line development and variety release tracking in RICE Management Information System	New rice varieties resulting in 1.3 % genetic gain in intensive systems
2021	20 varieties released for release with 15% higher yield and meeting national quality requirements,	Existence of lines and new varieties, line development and variety release tracking in RICE Management Information System	New rice varieties resulting in 1.3 % genetic gain in intensive systems
2022	Genetic gains at the end of the breeding cycle of 1.3% compared to 2016	Existence of lines and new varieties, line development and variety release tracking in RICE Management Information System	New rice varieties resulting in 1.3 % genetic gain in intensive systems

2018	Genes conferring tolerance of submergence, stagnant flooding, salinity, high/low temperatures, iron toxicity, drought, and blast conferred to elite backgrounds initial elite lines nominated for release	Existence of lines and new varieties, line development and variety release tracking in RICE Management Information System	Rice varieties with 20, 15, 10% reduction in yield loss caused by factors induced by climate change, in mega deltas, rainfed lowlands, and uplands, respectively
2019	Genes conferring tolerance of two of the relevant stresses in the three ecosystems combined in elite backgrounds initial elite lines nominated for release	Existence of lines and new varieties, line development and variety release tracking in RICE Management Information System	Rice varieties with 20, 15, 10% reduction in yield loss caused by factors induced by climate change, in mega deltas, rainfed lowlands, and uplands, respectively
2021	5-10 elite breeding lines and/or varieties combining tolerance of two to three of the relevant stresses in the three ecosystems developed, having 25-50% reduction in yield losses	Existence of lines and new varieties, line development and variety release tracking in RICE Management Information System	Rice varieties with 20, 15, 10% reduction in yield loss caused by factors induced by climate change, in mega deltas, rainfed lowlands, and uplands, respectively
2022	20, 15, 10% reduction in risk of yield loss in elite cultivars at the end of breeding cycle caused by factors induced by climate change, in mega deltas, rainfed lowlands, and uplands, respectively	Existence of lines and new varieties, line development and variety release tracking in RICE Management Information System	Rice varieties with 20, 15, 10% reduction in yield loss caused by factors induced by climate change, in mega deltas, rainfed lowlands, and uplands, respectively
2018	Novel tools and processes to capture specialty traits developed at key action sites to minimize chalk, enhance head rice recovery, capture cooking quality	Existence of lines and new varieties, line development and variety release tracking in RICE Management Information System	High quality and high nutritious rice varieties that are preferred by men and women farmers and consumers
2019	Nutritious rice with 20-22 ppm Zinc content	Existence of lines and new varieties, line development and variety release tracking in RICE Management Information System	High quality and high nutritious rice varieties that are preferred by men and women farmers and consumers
2020	breeding lines possessing low chalk (0-5%), higher head rice recovery (60% HRR), better cooking quality	Existence of lines and new varieties, line development and variety release tracking in RICE Management Information System	High quality and high nutritious rice varieties that are preferred by men and women farmers and consumers
2022	Slower digestable and low glycimic index rice lines and process products	Existence of lines and new varieties, line development and variety release tracking in RICE Management Information System indicators	High quality and high nutritious rice varieties that are preferred by men and women farmers and consumers
2019	20 genes validated for increase in chloroplast number	Reports, publications RICE Management Information System indicators	Prototype C4 rice lines with increased yield potential available
2020	One line with five transporter genes produced	Existence of rice line with 5 transporter genes, reports, publications RICE Management Information System indicators	Prototype C4 rice lines with increased yield potential available
2022	One line generated with increased flux into the C4 pathway	Existence of rice line with C4 characteristics, reports, publications RICE Management Information System indicators	Prototype C4 rice lines with increased yield potential available
2017	Capacity development needs on modern rice breeding technologies identified among partner research organizations	Reports, research projects at partner research organizations, RICE Management Information System updates	Increased capacity on modern rice breeding technologies in partner research organizations
2019	Research initiatives on modern rice breeding technologies with evidence of direct response to demand of rice value chain stakeholders	Reports, research projects at partner research organizations, RICE Management Information System updates	Increased capacity on modern rice breeding technologies in partner research organizations
2021	Local innovations in rice breeding using modern rice breeding technologies	Reports, research projects at partner research organizations, RICE Management Information System updates	Increased capacity on modern rice breeding technologies in partner research organizations

Uplift budget RICE - Additional outcomes and their costs (total and by source of funding), by flagship project
Costs are total over six years, US\$

Uplift budget is explained in section 1.0.2 and Table 2 of the RICE proposal ("high investment scenario")

Uplift Budget for RICE Flagship project 1: Accelerating impact and equity

Outcome Description	Amount Needed (\$)	W1 + W2 (%)	W3 (%)	Bilateral (%)	Other(%)
National systems use CRP-presented assessments of impacts of policy measures (free trade, domestic, variety release, import/export, WTO-related) to inform national policies	9,000,000	30	0	70	0
Novel tools used for large-scale adoption studies of improved rice technologies, eg remote sensing and DNA fingerprinting	9,000,000	30	0	70	0
Extensive network of women and rural development organizations that scale out RICE technologies that target women and marginalized groups	9,000,000	30	0	70	0

Uplift Budget for RICE Flagship project 2: Upgrading rice value chains

Outcome Description	Amount Needed (\$)	W1 + W2 (%)	W3 (%)	Bilateral (%)	Other(%)
Improved access by women and poor farmers to high-value markets through better functioning value chains	9,000,000	30	0	70	0
Full suite of improved postharvest technologies (threshing, drying, milling, storage, processing) to reduce losses in the value chain with 10-15%	9,000,000	30	0	70	0
Proof of concept for value chains using rice byproducts, such as straw and husk, that generate additional income for farmers (energy generation, mushroom cultivation, soil amendment, etc)	9,000,000	30	0	70	0

Uplift Budget for RICE Flagship project 3: Sustainable farming systems

Outcome Description	Amount Needed (\$)	W1 + W2 (%)	W3 (%)	Bilateral (%)	Other(%)
Framework to identify opportunities to strengthen resilience of women and the poor to climate risks and others shocks (together with other CRPs)	9,000,000	30	0	70	0
Enhanced benefits to the marginalized and poor derived from eco-system services provided by rice landscapes (with WLE)	9,000,000	30	0	70	0
Increased livelihoods of the poor through improvement management of coastal zones in mega deltas of Bangladesh, Guinea, India, Myanmar, Sierra leone, and Vietnam (with Fish, WLE)	9,000,000	30	0	70	0

Uplift Budget for RICE Flagship project 4: Global Rice Array

Outcome Description	Amount Needed (\$)	W1 + W2 (%)	W3 (%)	Bilateral (%)	Other(%)
Global phenotyping network expanded to include 3-5 countries in each major-rice growing continent, and feeding information to all major rice breeding programs across the continents	9,000,000	30	0	70	0
Pathogen information of all major rice diseases across the continents feeding into variety resistance breeding of all major rice breeding programs globally	9,000,000	30	0	70	0
Rice phenotypic and genotypic information integrated with environmental and socio-economic Big Data open access available to global users	9,000,000	30	0	70	0

Uplift Budget for RICE Flagship project 5: New rice varieties

Outcome Description	Amount Needed (\$)	W1 + W2 (%)	W3 (%)	Bilateral (%)	Other(%)
Rice varieties with 1.5 % genetic gain across the mega-rice-growing environments	9,000,000	30	0	70	0
10% increased (compared with base budget) use of rice genetic diversity through genotype sequencing of additional 2 K panel and gene identification	9,000,000	30	0	70	0
Healthy rice varieties released with low glycemic index and slow digestibility	9,000,000	30	0	70	0