

# GLDC PIM information

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PIM A TABLE: GLDC Contributions to the SRF targets in 2018-2022

| 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   | 8.9                 | million farm households | 60,608,060         | 10        | 20     | 70            | 0         | Genebanks, Genetic Gain platform  |
| 30 million people, of which 50% are women, assisted to exit poverty   | 4.4                 | million people          | 101,013,440        | 10        | 20     | 70            | 0         | Big Data, CCAFS, FTA, Genebanks, Genetic Gain platform,                         |
| Improve the rate of yield increase for major food staples from current <1% to 1.2-1.5% per year   | 1.2                 | %                       | 80,810,750         | 10        | 20     | 70            | 0         | Genebanks, Genetic Gain platform  |
| 30 million more people, of which 50% are women, meeting minimum dietary energy requirements   | 12.7                | million people          | 24,243,230         | 10        | 20     | 70            | 0         | A4NH, Genebanks, Genetic Gain platform, Livestock, Maize, PIM, Rice,            |
| 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 | 29.8                | million people          | 52,526,990         | 10        | 20     | 70            | 0         | A4NH, Genebanks, Genetic Gain platform, Livestock, Maize, PIM, Rice, RTB, Wheat |
| 10% reduction in women of reproductive age who are consuming less than the adequate number of food groups   | 7.5                 | %                       | 48,486,450         | 10        | 20     | 70            | 0         | A4NH, Genebanks, Genetic Gain platform, Livestock, Maize, PIM, Rice,            |
| 5% increase in water and nutrient (inorganic, biological) use efficiency in agro- ecosystems, including through recycling and reuse   | 4.9                 | %                       | 8,081,080          | 10        | 20     | 70            | 0         | CAAFS, Genebanks, Genetic Gain platform   |
| 55 million hectares (ha) degraded land area restored  | 0.2                 | millions of ha          | 4,040,540          | 10        | 20     | 70            | 0         | Livestock, Maize, Rice, RTB, Wheat  |
| 2.5 million ha of forest saved from deforestation   | 0.5                 | millions of ha          | 24,243,210         | 10        | 20     | 70            | 0         | Livestock   |
|   |                     | <b>Total</b>            | <b>404,053,750</b> |           |        |               |           |   |

## PIM A TABLE: GLDC Contributions to the SRF targets in 2018-2022

| CGIAR Target: 100 million more farm households have adopted improved varieties, breeds or trees, and / or improved management practices |               |                                |
|---|---------------|--------------------------------|
| CGIAR Target countries  | Other Country | Target contribution in country |
| Burkina Faso  | –             | 0.86                           |
| Ethiopia  | –             | 0.57                           |
| India   | –             | 2                              |
| Malawi  | –             | 0.57                           |
| Mali  | –             | 1.14                           |
| Niger   | –             | 0.28                           |
| Nigeria   | –             | 1.14                           |
| Myanmar   |               | 0.57                           |
| Sudan   |               | 0.28                           |
| Tanzania  | –             | 0.86                           |
| Uganda  | –             | 0.57                           |

| CGIAR Target: 30 million people, of which 50% are women, assisted to exit poverty |               |                                |
|---|---------------|--------------------------------|
| CGIAR Target countries  | Other Country | Target contribution in country |
| Burkina Faso  |               | 0.42                           |
| Ethiopia  |               | 0.28                           |
| India   |               | 1                              |
| Malawi  |               | 0.28                           |
| Mali  |               | 0.57                           |
| Niger   |               | 0.14                           |
| Nigeria   |               | 0.57                           |
| Myanmar   |               | 0.28                           |
| Sudan   |               | 0.14                           |
| Tanzania  |               | 0.42                           |
| Uganda  |               | 0.28                           |

**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 |
|------------------------|---------------|--------------------------------|
| Burkina Faso           | –             | 1.2                            |
| Ethiopia               | –             | 1.2                            |
| India                  | –             | 1.2                            |
| Malawi                 | –             | 1.2                            |
| Mali                   | –             | 1.2                            |
| Niger                  | –             | 1.2                            |
| Nigeria                | –             | 1.2                            |
| Myanmar                | –             | 1.2                            |
| Sudan                  | –             | 1.2                            |
| Tanzania               | –             | 1.2                            |
| Uganda                 | –             | 1.2                            |

**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 |
|------------------------|---------------|--------------------------------|
| Burkina Faso           | –             | 1.23                           |
| Ethiopia               | –             | 0.82                           |
| India                  | –             | 2.86                           |
| Malawi                 | –             | 0.82                           |
| Mali                   | –             | 1.63                           |
| Niger                  | –             | 0.41                           |
| Nigeria                | –             | 1.63                           |
| Myanmar                | –             | 0.82                           |
| Sudan                  | –             | 0.41                           |
| Tanzania               | –             | 1.23                           |
| Uganda                 | –             | 0.82                           |

**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 |
|------------------------|---------------|--------------------------------|
| Burkina Faso           | –             | 2.88                           |
| Ethiopia               | –             | 1.92                           |
| India                  | –             | 6.73                           |
| Malawi                 | –             | 1.92                           |
| Mali                   | –             | 3.85                           |
| Niger                  | –             | 0.96                           |
| Nigeria                | –             | 3.85                           |
| Myanmar                | –             | 1.92                           |
| Sudan                  | –             | 0.96                           |
| Tanzania               | –             | 2.88                           |
| Uganda                 | –             | 1.92                           |

**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 |
|------------------------|---------------|--------------------------------|
| Burkina Faso           | –             | 0.72                           |
| Ethiopia               | –             | 0.48                           |
| India                  | –             | 1.7                            |
| Malawi                 | –             | 0.48                           |
| Mali                   | –             | 0.97                           |
| Niger                  | –             | 0.24                           |
| Nigeria                |               | 0.97                           |
| Myanmar                | –             | 0.48                           |
| Sudan                  | –             | 0.24                           |
| Tanzania               | –             | 0.72                           |
| Uganda                 |               | 0.48                           |

**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 |
|------------------------|---------------|--------------------------------|
| Burkina Faso           | –             | 0.47                           |
| Ethiopia               | –             | 0.31                           |
| India                  | –             | 1.11                           |
| Malawi                 | –             | 0.31                           |
| Mali                   | –             | 0.63                           |
| Niger                  | –             | 0.16                           |
| Nigeria                |               | 0.63                           |
| Myanmar                | –             | 0.31                           |
| Sudan                  | –             | 0.16                           |
| Tanzania               | –             | 0.47                           |
| Uganda                 |               | 0.31                           |

| PIM TABLE B - Flagship 1: Priority Setting and Impact Acceleration   |                    |           |        |               |           |                  |                  |                    |                |
|--|--------------------|-----------|--------|---------------|-----------|------------------|------------------|--------------------|----------------|
| 2022 outcome description   | Amount needed (\$) | W1+W2 (%) | W3 (%) | Bilateral (%) | Other (%) | W1+W2 (Amount)   | W3 (Amount)      | Bilateral (Amount) | Other (Amount) |
| Outcome 1. Improved targeting and responsiveness of research to market and household demands in the face of climate change for greater technology adoption, food and nutrition security, resilience, and poverty reduction | 12,208,772         | 10        | 27     | 63            | 0         | 2,188,969        | 1,364,440        | 8,655,362          | 0              |
| Outcome 2. Market and household demand identified and trade-offs assessed for more inclusive value chains that improve income and nutrition status in target regions   | 8,720,550          | 10        | 27     | 63            | 0         | 1,563,549        | 974,600          | 6,182,401          | 0              |
| Outcome 3. Inclusive and equitable technologies and innovation systems established for accelerated and broadened impact  | 3,488,220          | 10        | 27     | 63            | 0         | 625,420          | 389,840          | 2,472,960          | 0              |
| Outcome 4. Prioritized scaling options for the agri- food systems with impact evidence and enabling policy support mechanisms for maximum livelihood impact and inclusiveness  | 10,464,662         | 10        | 27     | 63            | 0         | 1,876,260        | 1,169,520        | 7,418,882          | 0              |
|  | <b>34,882,204</b>  |           |        |               |           | <b>6,254,198</b> | <b>3,898,400</b> | <b>24,729,606</b>  | <b>0</b>       |

| PIM TABLE C - Flagship 1: Priority Setting and Impact Acceleration             |                    |           |        |               |           |                |             |                    |                |
|--|--------------------|-----------|--------|---------------|-----------|----------------|-------------|--------------------|----------------|
| Sub-IDO  | Amount needed (\$) | W1+W2 (%) | W3 (%) | Bilateral (%) | Other (%) | W1+W2 (Amount) | W3 (Amount) | Bilateral (Amount) | Other (Amount) |
| Reduced production risk  | 4047206            | 10        | 27     | 63            | 0         | 725,643        | 452,312     | 2,869,251          | 0              |
| Reduced market barriers  | 7038549            | 10        | 27     | 63            | 0         | 1,261,975      | 786,621     | 4,989,952          | 0              |
| Increased livelihood opportunities   | 7696372            | 10        | 27     | 63            | 0         | 1,379,920      | 860,139     | 5,456,314          | 0              |
| Increased access to diverse nutrient-rich                                      | 4297112            | 10        | 27     | 63            | 0         | 770,450        | 480,241     | 3,046,421          | 0              |
| Improved capacity of women and young people to participate in decision- making | 2200174            | 10        | 27     | 63            | 0         | 394,480        | 245,889     | 1,559,805          | 0              |
| Conducive agricultural policy environment                                      | 5077725            | 10        | 27     | 63            | 0         | 910,410        | 567,481     | 3,599,834          | 0              |

|   |                |    |    |    |   |                |                |                  |          |
|---|----------------|----|----|----|---|----------------|----------------|------------------|----------|
| Enhanced institutional capacity of partner research organizations | 2210179        | 10 | 27 | 63 | 0 | 396,274        | 247,007        | 1,566,898        | 0        |
| Increased capacity for innovation in partner development          | 2314888        | 10 | 27 | 63 | 0 | 415,047        | 258,710        | 1,641,131        | 0        |
| and in poor and vulnerable communities                            | 34,882,204     |    |    |    |   | 6,254,198      | 3,898,400      | 24,729,606       |          |
|   | <b>4047206</b> |    |    |    |   | <b>725,643</b> | <b>452,312</b> | <b>2,869,251</b> | <b>0</b> |

| PIM TABLE B - Flagship 2: Functional Agrifood Systems   |                    |           |        |               |           |                  |                   |                    |                |
|---|--------------------|-----------|--------|---------------|-----------|------------------|-------------------|--------------------|----------------|
| 2022 outcome description  | Amount needed (\$) | W1+W2 (%) | W3 (%) | Bilateral (%) | Other (%) | W1+W2 (Amount)   | W3 (Amount)       | Bilateral (Amount) | Other (Amount) |
| FP2.O1: Multi-dimensional impacts of innovative agricultural value chain options are transparent to governance actors and provide incentives for adapting the enabling environment. | 12,845,054         | 16        | 20     | 64            | 0         | 1,653,827        | 5,789,200         | 5,402,026          | 0              |
| FP2.O2: Actors in GDLC priority agricultural value chains developed innovative value chain options and are empowered to develop independently sustainable business models.          | 25,690,107         | 16        | 20     | 64            | 0         | 3,307,655        | 11,578,400        | 10,804,052         | 0              |
| FP2.O3: Governance mechanisms are revised and harmonized in a way that encourages improved agrifood system strategies adapted to specific social-ecological                         | 25,690,107         | 16        | 20     | 64            | 0         | 3,307,655        | 11,578,400        | 10,804,052         | 0              |
|   | <b>64,225,268</b>  |           |        |               |           | <b>8,269,137</b> | <b>28,946,001</b> | <b>27,010,130</b>  | <b>0</b>       |

| PIM TABLE C - Flagship 2: Functional Agrifood Systems   |                    |           |        |               |           |                  |                   |                    |                |
|---|--------------------|-----------|--------|---------------|-----------|------------------|-------------------|--------------------|----------------|
| Sub-IDO   | Amount needed (\$) | W1+W2 (%) | W3 (%) | Bilateral (%) | Other (%) | W1+W2 (Amount)   | W3 (Amount)       | Bilateral (Amount) | Other (Amount) |
| Reduced market barriers   | 12,845,054         | 16        | 20     | 64            | 0         | 1,653,827        | 5,789,201         | 5,402,026          | 0              |
| Increased value capture by producers  | 6,422,526          | 16        | 20     | 64            | 0         | 826,914          | 2,894,600         | 2,701,013          | 0              |
| Reduced pre and post-harvest losses, incl. climate change   | 6,422,526          | 16        | 20     | 64            | 0         | 826,914          | 2,894,600         | 2,701,013          | 0              |
| Increased availability of diverse nutrient-rich foods   | 12,845,054         | 16        | 20     | 64            | 0         | 1,653,827        | 5,789,201         | 5,402,026          | 0              |
| Increased capacity of beneficiaries to adopt research outputs   | 6,422,526          | 16        | 20     | 64            | 0         | 826,914          | 2,894,600         | 0                  | 0              |
| Conducive agricultural policy environment   | 12,845,054         | 16        | 20     | 64            | 0         | 1,653,827        | 5,789,200         | 5,402,026          | 0              |
| Increased capacity for innovation in partner development organizations and in poor and vulnerable communities | 6,422,526          | 16        | 20     | 64            | 0         | 826,914          | 2,894,600         | 2,701,013          | 0              |
|   | <b>64,225,268</b>  |           |        |               |           | <b>8,269,137</b> | <b>28,946,001</b> | <b>27,010,130</b>  | <b>0</b>       |

| PIM TABLE B - Flagship 3: Integrated Farm & Household Management  |                    |           |        |               |           |                   |                   |                    |                |
|---|--------------------|-----------|--------|---------------|-----------|-------------------|-------------------|--------------------|----------------|
| 2022 outcome description  | Amount needed (\$) | W1+W2 (%) | W3 (%) | Bilateral (%) | Other (%) | W1+W2 (Amount)    | W3 (Amount)       | Bilateral (Amount) | Other (Amount) |
| FP3.O1. Cropping systems sustainably intensified and diversified  | 25,109,128         | 12        | 14     | 74            | 0         | 3,436,672         | 4,363,456         | 17,309,000         | 0              |
| FP3.O2. Pest and diseases controlled safely and with reduced agro-chemical  | 44,949,609         | 12        | 14     | 74            | 0         | 6,152,227         | 7,811,328         | 30,986,053         | 0              |
| FP3.O3. Tested, adapted and validated options applied for sustainable intensification and livelihood diversification by | 21,467,690         | 12        | 14     | 74            | 0         | 2,938,270         | 3,730,648         | 14,798,771         | 0              |
|   | <b>91,526,427</b>  |           |        |               |           | <b>12,527,170</b> | <b>15,905,432</b> | <b>63,093,824</b>  | <b>0</b>       |

| PIM TABLE C - Flagship 3: Integrated Farm & Household Management                         |                    |           |        |               |           |                   |                   |                    |                |
|--|--------------------|-----------|--------|---------------|-----------|-------------------|-------------------|--------------------|----------------|
| Sub-IDO  | Amount needed (\$) | W1+W2 (%) | W3 (%) | Bilateral (%) | Other (%) | W1+W2 (Amount)    | W3 (Amount)       | Bilateral (Amount) | Other (Amount) |
| Reduced production risk  | 12,756,294         | 12        | 14     | 74            | 0         | 1,745,946.58      | 2,216,784.46      | 8,793,562          | 0              |
| Increased livelihood opportunities   | 7,168,595          | 12        | 14     | 74            | 0         | 981,161.47        | 1,245,756.04      | 4,941,677          | 0              |
| Reduced pre and post- harvest losses, incl. climate change                               | 22,234,679         | 12        | 14     | 74            | 0         | 3,043,247.71      | 3,863,935.07      | 15,327,496         | 0              |
| Increased safe use of inputs   | 1,255,456          | 12        | 14     | 74            | 0         | 171,833.55        | 218,172.74        | 865,450            | 0              |
| Gender-equitable control of productive assets and resources                              | 17,941,141         | 12        | 14     | 74            | 0         | 2,455,593.64      | 3,117,805.48      | 12,367,741         | 0              |
| Technologies that reduce women's labor and energy expenditure developed and disseminated | 9,152,642          | 12        | 14     | 74            | 0         | 1,252,716.86      | 1,590,543.08      | 6,309,382          | 0              |
| Improved capacity of women and young people to participate in decision- making           | 21,017,621         | 12        | 14     | 74            | 0         | 2,876,669.68      | 3,652,435.13      | 14,488,516         | 0              |
|  | <b>91,526,427</b>  |           |        |               |           | <b>12,527,170</b> | <b>15,905,432</b> | <b>63,093,824</b>  | <b>0</b>       |

| PIM TABLE B - Flagship 4: Variety and Hybrid Development  |                    |           |        |               |           |                   |                   |                    |                |
|---|--------------------|-----------|--------|---------------|-----------|-------------------|-------------------|--------------------|----------------|
| 2022 outcome description  | Amount needed (\$) | W1+W2 (%) | W3 (%) | Bilateral (%) | Other (%) | W1+W2 (Amount)    | W3 (Amount)       | Bilateral (Amount) | Other (Amount) |
| FP4.01. New varieties & allied innovations improving productivity & production potential, agribusiness opportunity & stabilize food supply.                 | 130,505,325        | 7         | 19     | 74            | 0         | 15,299,969        | 19,309,278        | 95,896,077         | 0              |
| FP4.02. Robust and responsive global to national breeding systems produce and deliver novel varieties and allied innovations at appropriate scale and scope | 37,452,903         | 7         | 19     | 74            | 0         | 4,390,842         | 5,541,448         | 27,520,612         | 0              |
|   | <b>167,958,228</b> |           |        |               |           | <b>19,690,812</b> | <b>24,850,727</b> | <b>123,416,689</b> |                |

PIM TABLE C - Flagship 4: Variety and Hybrid Development

| Sub-IDO  | Amount needed (\$) | W1+W2 (%) | W3 (%) | Bilateral (%) | Other (%) | W1+W2 (Amount)    | W3 (Amount)       | Bilateral (Amount) | Other (Amount) |
|--|--------------------|-----------|--------|---------------|-----------|-------------------|-------------------|--------------------|----------------|
| Reduced production risk  | 16,795,820         | 7         | 19     | 74            | 0         | 1,969,081         | 2,485,072         | 12,341,667         | 0              |
| Reduced pre and post- harvest losses, incl. climate  | 16,795,820         | 7         | 19     | 74            | 0         | 1,969,081         | 2,485,072         | 12,341,667         | 0              |
| Closed yield gaps through improved agronomic and animal husbandry practices                      | 25,193,730         | 7         | 19     | 74            | 0         | 2,953,621         | 3,727,608         | 18,512,501         | 0              |
| Enhanced genetic gains   | 16,795,820         | 7         | 19     | 74            | 0         | 1,969,081         | 2,485,072         | 12,341,667         | 0              |
| Increased availability of diverse nutrient-rich foods  | 16,795,820         | 7         | 19     | 74            | 0         | 1,969,081         | 2,485,072         | 12,341,667         | 0              |
| Reduced biological and chemical hazards in the food system                                       | 16,795,820         | 7         | 19     | 74            | 0         | 1,969,081         | 2,485,072         | 12,341,667         | 0              |
| Increased resilience of agro-ecosystems and communities, especially those including smallholders | 25,193,730         | 7         | 19     | 74            | 0         | 2,953,621         | 3,727,608         | 18,512,501         | 0              |
| Gender-equitable control of productive assets and resources                                      | 8,397,910          | 7         | 19     | 74            | 0         | 984,540           | 1,242,536         | 6,170,834          | 0              |
| Increased capacity of beneficiaries to adopt research outputs                                    | 10,077,492         | 7         | 19     | 74            | 0         | 1,181,449         | 1,491,043         | 7,405,000          | 0              |
| Increased capacity for innovation in partner research organizations                              | 15,116,264         | 7         | 19     | 74            | 0         | 1,772,176         | 2,236,569         | 11,107,519         | 0              |
|  | <b>167,958,228</b> |           |        |               |           | <b>19,690,812</b> | <b>24,850,727</b> | <b>123,416,689</b> | <b>0</b>       |

| PIM TABLE B - Flagship 5: Pre-Breeding and Trait Discovery   |                    |           |        |               |           |                  |                  |                    |                |
|--|--------------------|-----------|--------|---------------|-----------|------------------|------------------|--------------------|----------------|
| 2022 outcome description   | Amount needed (\$) | W1+W2 (%) | W3 (%) | Bilateral (%) | Other (%) | W1+W2 (Amount)   | W3 (Amount)      | Bilateral (Amount) | Other (Amount) |
| FP5.O1. Prebreeding products through use of genebanks and other sources and modern tools to increase genetic   | 6,819,244          | 8         | 20     | 72            | 0         | 1,178,765        | 829,980          | 4,810,498          | 0              |
| FP5.O2. Trait discovery and development based on genomics and phenomics to generate new markers to support trait integration through use of modern enabling technologies and forward breeding  | 27,276,977         | 8         | 20     | 72            | 0         | 4,715,061        | 3,319,920        | 19,241,993         | 0              |
| FP5.O3. National researchers able to apply the acquired skills in other pre-breeding programmes. Development of enabling technologies platforms to be used for rapid trait discovery, trait validation, trait development, and trait introgression | 11,365,407         | 8         | 20     | 72            | 0         | 1,964,609        | 1,383,300        | 8,017,497          | 0              |
|  | <b>45,461,627</b>  |           |        |               |           | <b>7,858,435</b> | <b>5,533,200</b> | <b>32,069,988</b>  | <b>0</b>       |

| <b>PIM TABLE C - Flagship 5: Pre-Breeding and Trait Discovery</b>                            |                           |                  |               |                      |                  |                       |                    |                           |                       |
|--|---------------------------|------------------|---------------|----------------------|------------------|-----------------------|--------------------|---------------------------|-----------------------|
| <b>Sub-IDO</b>   | <b>Amount needed (\$)</b> | <b>W1+W2 (%)</b> | <b>W3 (%)</b> | <b>Bilateral (%)</b> | <b>Other (%)</b> | <b>W1+W2 (Amount)</b> | <b>W3 (Amount)</b> | <b>Bilateral (Amount)</b> | <b>Other (Amount)</b> |
| Reduced production risk  | 2,727,697                 | 8                | 20            | 72                   | 0                | 471,506               | 331,992            | 1,924,199                 | 0                     |
| Reduced pre and post-harvest losses, incl. climate change                                    | 4,546,163                 | 8                | 20            | 72                   | 0                | 785,843               | 553,320            | 3,206,999                 | 0                     |
| Enhanced genetic gains   | 27,845,247                | 8                | 20            | 72                   | 0                | 4,813,291             | 3,389,085          | 19,642,868                | 0                     |
| Increased conservation and use of genetic resources  | 1,363,850                 | 8                | 20            | 72                   | 0                | 235,753               | 165,996            | 962,100                   | 0                     |
| Increased availability of diverse nutrient-rich foods  | 3,864,239                 | 8                | 20            | 72                   | 0                | 667,967               | 470,322            | 2,725,949                 | 0                     |
| Enhanced capacity to deal with climatic risks and extremes                                   | 1,932,119                 | 8                | 20            | 72                   | 0                | 333,983               | 235,161            | 1,362,974                 | 0                     |
| Enhanced individual capacity in partner research organizations through training and exchange | 3,182,313                 | 8                | 20            | 72                   | 0                | 550,090               | 387,324            | 2,244,899                 | 0                     |
|  | <b>45,461,627</b>         |                  |               |                      |                  | <b>7,858,435</b>      | <b>5,533,200</b>   | <b>32,069,988</b>         | <b>0</b>              |

**PIM TABLE D - Flagship 1: Priority Setting and Impact Acceleration**

| <b>Year</b> | <b>Milestone description</b>  | <b>Means of verifying</b>  | <b>For which outcomes</b>   |
|-------------|---|--|---|
| <b>2018</b> | Pre-proposal foresight and ex-ante impact analyses conducted to guide priorities across crops, countries, and the major technical lines of GLDC research. This involves: (a) yield gaps/constraints analysis to identify a set of potential research and technology options and to estimate the associated yield gains or yield loss reductions; (b) ex-ante impact evaluation to estimate potential economic benefits and rates of return; and (c) foresight analysis of production and demand for GLDC crops. | GLDC proposal with the crop, country, and trait priorities informed by the results of the foresight and ex-ante impact analyses. The detailed foresight and ex-ante impact evaluation reports should also be made available either as annexes or in a shared folder. | FP1.O1: Improved targeting and responsiveness of research to market and household demands in the face of climate change for greater technology adoption, food and nutrition security, resilience, and poverty reduction |
| <b>2019</b> | Expanded foresight and ex-ante evaluation of GLDC research and technology options (including quality improvement research) conducted and preliminary results shared on the potential economic, environmental, and poverty reduction impacts   | Preliminary foresight and ex-ante impact evaluation results that will be shared with GLDC researchers and stakeholders at the annual review and planning meeting to seek feedback and further inputs   | FP1.O1: Improved targeting and responsiveness of research to market and household demands in the face of climate change for greater technology adoption, food and nutrition security, resilience, and poverty reduction |
| <b>2020</b> | Expanded foresight and ex-ante evaluation of GLDC research and technology options (including quality improvement research) completed and working papers published on the potential economic, environmental, and poverty reduction impacts to guide priority setting   | Foresight and ex-ante evaluation working papers and the final results that will be shared with GLDC researchers and stakeholders at the annual review and planning meeting   | FP1.O1: Improved targeting and responsiveness of research to market and household demands in the face of climate change for greater technology adoption, food and nutrition security, resilience, and poverty reduction |
| <b>2021</b> | The results of the priority assessment process applied in consultation with GLDC management and scientists to adjust GLDC priorities for increased research effectiveness and efficiency  | Refined GLDC program with adjusted work plans for 2021 featuring priority research options and countries   | FP1.O1: Improved targeting and responsiveness of research to market and household demands in the face of climate change for greater technology adoption, food and nutrition security, resilience, and poverty reduction |
| <b>2022</b> | Ex-ante case studies conducted to assess the potential impacts of alternative lines of GLDC research addressing emerging constraints and opportunities  | Preliminary ex-ante case study results that will be shared with GLDC researchers and stakeholders at the annual review and planning meeting  | FP1.O1: Improved targeting and responsiveness of research to market and household demands in the face of climate change for greater technology adoption, food and nutrition security, resilience, and poverty reduction |
| <b>2022</b> | Ex-ante case studies completed and working papers published on the potential impacts of alternative lines of GLDC research addressing emerging constraints and opportunities  | Ex-ante case study working papers and the final results that will be shared with GLDC researchers and stakeholders at the annual review and planning meeting   | FP1.O1: Improved targeting and responsiveness of research to market and household demands in the face of climate change for greater technology adoption, food and nutrition security, resilience, and poverty reduction |

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| <b>2018</b> | Diversity of farm household preferences vis-a-vis market demand by context outlined in view of research in GLDC  | At least one paper by region outlining household typologies and market demands  | FP1.02: Market and household demand identified and trade-offs assessed for more inclusive value chains that improve income and nutrition status in target regions |
| <b>2019</b> | Shared learning across GLDC stakeholders and FPs on implications of diverse targets aspirations and future scenarios leading to strategic adjustments.         | Report on diversity of target group preferences and match and mismatch of GLDC research targets based on meetings and workshops across GLDC   | FP1.02: Market and household demand identified and trade-offs assessed for more inclusive value chains that improve income and nutrition status in target regions |
| <b>2020</b> | Underlying principles established for diversity assessment and matching of technologies across contexts  | Published options of how to meet diverse target group needs in GLDC research and scaling  | FP1.02: Market and household demand identified and trade-offs assessed for more inclusive value chains that improve income and nutrition status in target regions |
| <b>2021</b> | Verification of varying targets and improvements in research outcome match for adoption and marketing  | Assessment of changes in strategies and implications for matching household needs and market and value chain demands  | FP1.02: Market and household demand identified and trade-offs assessed for more inclusive value chains that improve income and nutrition status in target regions |
| <b>2022</b> | Technologies matched to typologies and contexts. Fine tuning of typologies   | Report on early adoption and household feedback for fine-tuning of typologies to improve GLDC research strategy   | FP1.02: Market and household demand identified and trade-offs assessed for more inclusive value chains that improve income and nutrition status in target regions |
| <b>2022</b> | Technologies matched to typologies and contexts. Outcome/effectiveness assessment for learning related to adoption at scale and increased market participation | Verification of improved adoption speed and value chain inclusiveness for higher profits and nutrition based on improved technologies targeting   | FP1.02: Market and household demand identified and trade-offs assessed for more inclusive value chains that improve income and nutrition status in target regions |
| <b>2018</b> | Inclusive and equitable innovation system for accelerating impacts for women and young people designed and piloted underlying design principles proven         | Innovation systems for empowering women and youth design reports sex disaggregated and gender relevant datasets policy brief [paper] on gender and social analysis informing intervention design                          | FP1.03: Inclusive and equitable technologies and innovation systems established for accelerated and broadened impact across the agrifood system                   |
| <b>2019</b> | Inclusive and equitable innovation system tested and adjusted to different biophysical and socioeconomic contexts including policy interactions                | Reports on performance of innovation systems for women and youth in different contexts including recommendations for enabling environments synthesis report [paper] on improved capacities and skills for women and youth | FP1.03: Inclusive and equitable technologies and innovation systems established for accelerated and broadened impact across the agrifood system                   |

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| <b>2020</b> | Functioning innovation systems established across GLDC sites and sustainably operating. Design of scaling systems in collaboration with CoA 1.4         | Scaling out strategy for innovation systems for women and youth documented number of women and youth impacted by interventions documented   | FP1.O3: Inclusive and equitable technologies and innovation systems established for accelerated and broadened impact across the agrifood system                          |
| <b>2021</b> | Functioning innovation systems established across GLDC sites and sustainably operating. Scaling out supported and system fine-tuned to new target areas | A synthesis report on performance of innovation systems for women and youth in scale-out areas Report [paper] on improved market opportunities for women and youth                          | FP1.O3: Inclusive and equitable technologies and innovation systems established for accelerated and broadened impact across the agrifood system                          |
| <b>2022</b> | Functioning innovation systems in place and supported in all target countries   | Reports on sustainability of innovation systems for women and youth impact assessment of innovations on women and youth [income, nutrition, livelihoods, market engagement] reports [paper] | FP1.O3: Inclusive and equitable technologies and innovation systems established for accelerated and broadened impact across the agrifood system                          |
| <b>2022</b> | Inclusive innovation systems running independently  | Synthesis publication on progress and sustainability of innovation systems for women and youth  | FP1.O3: Inclusive and equitable technologies and innovation systems established for accelerated and broadened impact across the agrifood system                          |
| <b>2018</b> | Options by context testing system designed for improved impact assessment and scaling facilitation  | Reports on scaling facilitation through design of options by context testing system   | FP1.O4: Prioritized scaling options for the agrifood systems with impact evidence and enabling policy support mechanisms for maximum livelihood impact and inclusiveness |
| <b>2019</b> | Improved options by context testing system designed for improved impact assessment and scaling facilitation   | Reports on scaling facilitation through design of options by context testing system   | FP1.O4: Prioritized scaling options for the agrifood systems with impact evidence and enabling policy support mechanisms for maximum livelihood impact and inclusiveness |
| <b>2020</b> | Option testing in collaboration with other FPs across heterogeneous conditions analyzed and scaling potential assessed                                  | Report on implications for scaling based on option by context testing results   | FP1.O4: Prioritized scaling options for the agrifood systems with impact evidence and enabling policy support mechanisms for maximum livelihood impact and inclusiveness |
| <b>2021</b> | Early impact and policy implications assessed and disseminated  | Early impact assessments documented and communicated  | FP1.O4: Prioritized scaling options for the agrifood systems with impact evidence and enabling policy support mechanisms for maximum livelihood impact                   |

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| 2022 | Detailed feedback from impact assessment for GLDC and stakeholder learning and 2-way strategic adjustments                        | Synthesis of workshop reports and extent of strategic adjustments.                               | FP1.O4: Prioritized scaling options for the agrifood systems with impact evidence and enabling policy support mechanisms for maximum livelihood impact and inclusiveness |
| 2022 | Policy recommendations to support scaling and facilitation of spillovers based on learning from detailed impact studies conducted | Documentation of policy recommendations to support scaling and detailed impact studies published | FP1.O4: Prioritized scaling options for the agrifood systems with impact evidence and enabling policy support mechanisms for maximum livelihood impact and inclusiveness |

| PIM TABLE D - Flagship 2: Functional Agrifood Systems |  |   |   |
|---|--|---|---|
| Year  | Milestone description  | Means of verifying  | For which outcomes  |
| 2018  | Tools are developed and open accessible to assess multidimensional value chain outcome preferences of stakeholders in agrifood systems. At least 50 NARS partners in eight target countries are trained in applying tools. | Publication, Reports, technical document, reports of partner institutions | FP2.O1: Multi-dimensional impacts of innovative agricultural value chain options are transparent to governance actors and provide incentives for adapting the enabling environment. |
| 2022  | In at least eight target countries multidimensional value chain outcome preferences of stakeholders in agrifood systems have been assessed.  | Publication, Reports, technical document, reports of partner institutions | FP2.O1: Multi-dimensional impacts of innovative agricultural value chain options are transparent to governance actors and provide incentives for adapting the enabling environment. |
| 2018  | Tools are developed and open accessible to assess multidimensional value chain outcomes in agrifood systems. At least 50 NARS partners in eight target countries are trained in applying tools.                            | Publication, Reports, technical document, reports of partner institutions | FP2.O1: Multi-dimensional impacts of innovative agricultural value chain options are transparent to governance actors and provide incentives for adapting the enabling environment. |
| 2022  | In at least eight target countries multidimensional value chain outcomes in agrifood systems have been assessed.   | Publication, Reports, technical document, reports of partner institutions | FP2.O1: Multi-dimensional impacts of innovative agricultural value chain options are transparent to governance actors and provide incentives for adapting the enabling environment. |
| 2019  | Dryland cereals and legumes post-harvest and commercial technologies available in the market and linked to seed systems in FP3.  | Publication, Reports, technical document                                  | FP2.O2: Actors in GDLC priority agricultural value chains developed innovative value chain options and are empowered to develop independently sustainable business models.          |
| 2022  | New entrepreneurs with enhanced capacity to sustain their businesses and enhanced efficiency of public sector stakeholders in post-harvest & food processing of GLDC crops.  | Publication, Reports, technical document                                  | FP2.O2: Actors in GDLC priority agricultural value chains developed innovative value chain options and are empowered to develop independently sustainable business models.          |

|             |  |   |  |
|-------------|--|---|--|
| <b>2022</b> | Value chain (digitalized) of GLDC crops strengthened and increased market share of GLDC crops based products.  | Publication, Reports, technical document                                  | FP2.O2: Actors in GDLC priority agricultural value chains developed innovative value chain options and are empowered to develop independently sustainable business models. |
| <b>2022</b> | Reduced post-harvest losses and drudgery (especially women), improved product quality and enhanced market demand of GLDC crop based products.  | Publication, Reports, technical document, government statistics           | FP2.O2: Actors in GDLC priority agricultural value chains developed innovative value chain options and are empowered to develop independently sustainable business models. |
| <b>2020</b> | Improved supply chain management and products quality leading to post-harvest losses.  | Publication, Reports, technical document, government statistics           | FP2.O2: Actors in GDLC priority agricultural value chains developed innovative value chain options and are empowered to develop independently sustainable business models. |
| <b>2022</b> | Nutritious and Innovative GLDC crop-based food products formulated based on market demand.   | Publication, Reports, technical document, third party broad based surveys | FP2.O2: Actors in GDLC priority agricultural value chains developed innovative value chain options and are empowered to develop independently sustainable business models. |
| <b>2022</b> | Nutritional database of GLDC crops created for use by public and private sector through linkage with CRP A4NH  | Publication, Reports, technical document, partner reporting               | FP2.O2: Actors in GDLC priority agricultural value chains developed innovative value chain options and are empowered to develop independently sustainable business models. |
| <b>2018</b> | Analytical decision support tools developed for analyzing institutional frameworks related to GLDC value chains. At least 50 NARS partners in eight target countries are trained in applying tools.  | Publication, Reports, technical document, reports of partner institutions | FP2.O3: Governance mechanisms are revised and harmonized in a way that encourages improved agrifood system strategies adapted to specific social-ecological contexts.      |
| <b>2019</b> | Risks for markets to fail capturing critical societal outcomes across the value chain are identified in at least 8 target countries. Critical agrifood system actors, especially governance actors are aware of these risks.   | Publication, Reports, technical document                                  | FP2.O3: Governance mechanisms are revised and harmonized in a way that encourages improved agrifood system strategies adapted to specific social-ecological contexts.      |
| <b>2019</b> | Interactions between community norms and rules, customary and statutory laws and policies in agrifood systems are well understood in different social-ecological system Approaches and tools are handed over to government and non-government implementing agencies and policy makers supporting context specific institutional change towards innovative agrifood system strategies | Publication, Reports, technical document, reports of partner institutions | FP2.O3: Governance mechanisms are revised and harmonized in a way that encourages improved agrifood system strategies adapted to specific social-ecological contexts.      |
| <b>2022</b> | Innovative governance approaches supporting innovative agrifood system strategies are tested in cooperation with multiple governance actors.   | Publication, Reports, technical document, reports of partner institutions | FP2.O3: Governance mechanisms are revised and harmonized in a way that encourages improved agrifood system strategies adapted to specific social-ecological                |

| Year | Milestone description  | Means of verifying  | For which outcomes   |
|------|--|---|--|
| 2019 | Map out areas suitable for crop diversification using GIS. Participatory field trials under smallholder conditions to evaluate the different cropping systems under different environments in different countries for farmers with landholdings less than 1 ha | a) Maps, b) reports on field trials, c) publications  | FP3.O1: Cropping systems sustainably intensified and diversified |
| 2022 | Crop simulation modelling used to evaluate different crop sequence and crop mixes scenarios under different biophysical, climatic and socio-economic conditions. One model for each system to be applicable to different countries with similar conditions.    | a) models/tools b) Publications (Articles, Proceeding)  | FP3.O1: Cropping systems sustainably intensified and diversified |
| 2019 | 300,000 farmers are trained in the use of crop mixes and sequences in which they have jointly identified with researcher for better water and soil management  | Research and evaluation reports, training manuals, fact sheets and other IEC material   | FP3.O1: Cropping systems sustainably intensified and diversified |
| 2022 | 300,000 farmers in project sites increase the diversity within cropping a systems in their water and soil management developed by the joint farmer-researcher program  | Research and evaluation reports, training manuals, fact sheets and other IEC material   | FP3.O1: Cropping systems sustainably intensified and diversified |
| 2019 | At least two options per site per country to promote diversified, profitable and sustainable crop livestock systems discussed and agreed upon with local communities and researchers   | a) Research reports, b) economic evaluation reports, c) field days and farmer exchange visits   | FP3.O1: Cropping systems sustainably intensified and diversified |
| 2022 | The area managed with diversified, profitable and sustainable crop-livestock systems is increased by 20% from the baseline figure in project sites   | a) Maps, b) reports, c) national statistics, d) local partners  | FP3.O1: Cropping systems sustainably intensified and diversified |
| 2019 | Methods developed to document the land area the target sites that use crop mixtures and sequences as a means to minimize crop damage in project sites without increasing pesticide use   | a) Research reports, b) publications and media releases   | FP3.O1: Cropping systems sustainably intensified and diversified |
| 2022 | At least 20% increase in land area under crop mixtures and or crop sequences as a means to minimize crop damage in project sites without increasing pesticide use and reduced exposure to soil erosion   | a) research reports, b) publications and media releases, c) farmer field days and exchange visits   | FP3.O1: Cropping systems sustainably intensified and diversified |
| 2022 | Draught implements developed by NARS tested and promoted on farm and extended to other countries for diversified cropping systems  | a) Research and training reports  | FP3.O1: Cropping systems sustainably intensified and diversified |
| 2022 | 20% female and youth farmers in target areas are trained to improve efficiency in use of draught animals   | a) Research and training reports (with gender disaggregation), b) training manuals, fact sheets and other IEC material, c) number of female and youth farmers trained | FP3.O1: Cropping systems sustainably intensified and diversified |
| 2019 | Appropriate mechanization technologies identified and a strategy for comparison testing established. Technologies tested and extension training packages developed, ensuring that perverse incentives are not present  | a) Research reports, b) training manuals and other IEC material, c) local partners (including NARS, NGOs and CBOs)  | FP3.O1: Cropping systems sustainably intensified and diversified |

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|------|--|--|--|
| 2022 | NARS promote at least three technical schemes adapted to smallholder farmers that reduce on farm and post-harvest losses   | a) Research reports, b) training manuals and other IEC material, c) local partners (including NARS, NGOs and CBOs) | FP3.O1: Cropping systems sustainably intensified and diversified   |
| 2019 | Appropriate mechanization technologies (production, harvesting and processing) identified and a strategy for comparison testing established  | a) Private partnerships, b) local partners c) national statistics  | FP3.O1: Cropping systems sustainably intensified and diversified   |
| 2022 | At least one processing company or group per project site/district use different production, harvesting and processing equipment that can use diversified materials adapted to women and youth use | a) Private partnerships, b) local partners c) national statistics  | FP3.O1: Cropping systems sustainably intensified and diversified   |
| 2022 | At least four local government development and/or local extension units provide access and training to the use of mechanization adapted to small holder farmers                                    | a) Local partners b) national statistics, c) publications and press releases                                       | FP3.O1: Cropping systems sustainably intensified and diversified   |
| 2018 | Pest and diseases management components for the target pests in different regions fine-tuned   | Publication, Reports   | FP3.O2: Pest and diseases controlled safely and with reduced agro- chemical inputs   |
| 2018 | Pest and diseases management components for the target pests in different regions evaluated  | Publication, Reports   | FP3.O2: Pest and diseases controlled safely and with reduced agro- chemical inputs   |
| 2019 | Efficacy of selected pest and diseases management confirmed  | Publication, Reports   | FP3.O2: Pest and diseases controlled safely and with reduced agro- chemical inputs   |
| 2020 | Effective pest and disease management components evaluated for controlling the target pests  | Publication, Reports   | FP3.O2: Pest and diseases controlled safely and with reduced agro- chemical inputs   |
| 2021 | Efficacy of effective IPM modules confirmed in the target regions  | Publication, Reports, technical document   | FP3.O2: Pest and diseases controlled safely and with reduced agro- chemical inputs   |
| 2022 | IPM modules for pest and disease management in different crops/ cropping systems in the target regions ready for scaling   | Publication, Reports, technical document   | FP3.O2: Pest and diseases controlled safely and with reduced agro- chemical inputs   |
| 2020 | Portfolios of household activities, enterprises and management practices that materially and equitably enhance livelihoods (as defined at sub-IDO level) while minimizing negative externalities.  | Publication, Reports, technical document   | FP3.O3: Tested, adapted and validated options applied for SI and livelihood diversification delivering livelihood benefits for rural households. |
| 2022 | Evidence that household interventions can generate beneficial impacts on CGIAR sub-IDOs at scale.  | Publication, Reports, technical document, third party surveys  | FP3.O3: Tested, adapted and validated options applied for SI and livelihood diversification delivering livelihood benefits for rural households. |

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|-------------|--|---|--|
| <b>2022</b> | Environmental and livelihood impacts of GLDC intervention tested at scale to avoid negative unintended consequences, and amplifying synergies contributing to, poverty reduction, equitable access to development opportunities, and nutritional security identified taking into account ecosystem services. | Publication, Reports, technical document                                  | FP3.O3: Tested, adapted and validated options applied for SI and livelihood diversification delivering livelihood benefits for rural households. |
| <b>2022</b> | Improved understanding of the social-ecological factors strongly affecting livelihood system impacts in drylands.  | Publication, Reports, technical document                                  | FP3.O3: Tested, adapted and validated options applied for SI and livelihood diversification delivering livelihood benefits for rural households. |
| <b>2022</b> | Awareness created amongst key stakeholders for trade-offs and synergies at scale related to alternative livelihood strategies.   | Publication, Reports, technical document, review of partner documentation | FP3.O3: Tested, adapted and validated options applied for SI and livelihood diversification delivering livelihood benefits for rural households. |

**PIM TABLE D - Flagship 4: Variety and Hybrid Development**

| <b>Year</b>    | <b>Milestone description</b>   | <b>Means of verifying</b>  | <b>For which outcomes</b>  |
|----------------|--|--|--|
| <b>2018</b>    | Breeding lines from Phase I of the CRP being tested by NARS and CGIAR - 8 crops X 3 trait clusters X 2 regions advanced.   | Publication, Reports, technical document                             | FP4.O1: New technologies improve production and productivity reducing yield gap and sustaining supply  |
| <b>2018</b>    | Phase I genetic materials deployed in GLDC crop improvement by CGIAR centers - annually 8 crops X 3 trait clusters X 2 regions tested by NARS.   | Publication, Reports, technical document                             | FP4.O1: New technologies improve production and productivity reducing yield gap and sustaining supply  |
| <b>2018</b>    | Breeding lines from Phase I enter the National performance trials or release - 8 crops X 3 trait clusters-3-4 lines per trait X 2 regions entered in NPT.                                  | Publication, Reports by the CGIAR and Partner                        | FP4.O1: New technologies improve production and productivity reducing yield gap and sustaining supply  |
| <b>2018</b>    | Nursery management strengthened to support early generation seed availability for evaluations<br>- 9 crops X 2 priority trait clusters (1° & 2°)- 20 lines per trait X 2 regions supplied. | Publication, Reports, technical document                             | FP4.O2: Robust and responsive global to national breeding systems produce and deliver novel varieties and allied innovations at appropriate scale and scope.   |
| <b>2018/19</b> | New suite of resilient varieties released by NARS partners. (Phase 1 investments start being released)   | Publication, Reports, Variety Registration Certificates, MoA reports | FP4.O1: New technologies improve production and productivity reducing yield gap and sustaining supply  |
| <b>2018</b>    | Studies conducted to inform the seed systems strengthening areas for target cereals and legumes - at least 1 study per crop x agrifood systems x region.                                   | Publication, Reports, technical document                             | FP4.O2: Robust and responsive global to national breeding systems produce and deliver novel varieties and allied innovations at appropriate scale and scope underpinned by FP4 short term on seed systems outcome. |
| <b>2018</b>    | Complementary partners engaged to support scaling efforts based on country strategies.   | Publication, Reports by the CGIAR and Partner                        | FP4.O2: Robust and responsive global to national breeding systems produce and deliver novel varieties and allied innovations at appropriate scale and scope.   |

|             |   |   |   |
|-------------|---|---|---|
| <b>2020</b> | NARS partners supplied with advanced breeding lines from GLDC - crops X 2 priority trait clusters (1° & 2°)- 30 lines per trait X 2 regions supplied.   | Publication, Reports, technical document, copies of MTAs  | FP4.O1: New technologies improve production and productivity reducing yield gap and sustaining supply   |
| <b>2020</b> | TPEs guide deployment of new varieties in places where they have the highest likelihood for adaptability and adoption. At least two trials Africa and one in India by end of year two and annually for the rest of the CRP.             | Publication, Reports, technical document  | FP4.O2: Robust and responsive global to national breeding systems produce and deliver novel varieties and allied innovations at appropriate scale and scope underpinned by FP4 short term outcome on breeding program efficiency improvement. |
| <b>2021</b> | Improved legumes and dry land cereals meet current and emerging and diverse demand for food and feeds leading to increased competitiveness of GLDC commodities.   | MoA reports, Publication, Reports by the CGIAR and Partner  | FP4.O2: Robust and responsive global to national breeding systems produce and deliver novel varieties and allied innovations at appropriate scale and scope.  |
| <b>2018</b> | Gender studies and opportunities for youth in agriculture conducted. At least 2 interventions per region studied- 2 in Africa and 2 in Asia.  | Reports on gender analysis. This will also include research and training reports (with gender disaggregation), b) training manuals, fact sheets and other IEC material, c) number of female and youth farmers trained | FP4.O2: Robust and responsive global to national breeding systems produce and deliver novel varieties and allied innovations at appropriate scale and scope.  |
| <b>2022</b> | NARs staff trained in new advances and analytics, limited infrastructure development. Annually at least 100 staff trained 10 per crop for Africa and Asia respectively.   | a) Training reports (with gender disaggregation), b) training manuals, fact sheets and other IEC material, c) number of female and youth farmers trained, Infrastructure developed etc.                               | FP4.O2: Robust and responsive global to national breeding systems produce and deliver novel varieties and allied innovations at appropriate scale and scope underpinned by FP4 short term outcome on capacity.                                |
| <b>2020</b> | New varieties deployed as part of IPM/IDM minimize use of chemicals. Will target legumes and susceptible cereals, releasing 2-3 new varieties for each crop biannually per partner country.   | Publication, Reports, technical document  | FP4.O1: New technologies improve production and productivity reducing yield gap and sustaining supply.  |
| <b>2022</b> | New varieties will minimize food contamination with mycotoxins are released   | Publication, Reports, technical document  | FP4.O1: New technologies improve production and productivity reducing yield gap and sustaining supply   |
| <b>2022</b> | Snap millets that are easy to harvest, easy to shell, machine amenable varieties for harvesting, pesticide use etc.   | Reports on gender analysis. This will also include research and training reports (with gender disaggregation), b) training manuals, fact sheets and other IEC material, c) number of female and youth farmers trained | FP4.O1: New technologies improve production and productivity reducing yield gap and sustaining supply   |
| <b>2022</b> | Participatory breeding methods and Innovation platforms used as early as 2018 in partnership with FP2 and FP3 involving communities and partners in target countries. The new varieties will be the building block for such activities. | a) research reports, b) training manuals and other IEC material, c) local partners (including NARS, NGOs and CBOs), engaged, infrastructure developed, Partnerships leveraged.  | FP4.O2: Robust and responsive global to national breeding systems produce and deliver novel varieties and allied innovations at appropriate scale   |

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| <b>2022</b> | NARS partners trained in participatory breeding methods, as well as gender and its role on adoption of new varieties. Other skills sets included Marker assisted breeding in partnership with FP5 At least. (Annually at least 100 staff trained 10 per crop for Africa and Asia respectively) | a) Training reports (with gender disaggregation), b) training manuals, fact sheets and other IEC material, c) number of female and youth farmers trained, Infrastructure developed etc. | FP4.O2: Robust and responsive global to national breeding systems produce and deliver novel varieties and allied innovations at appropriate scale |
|-------------|--|---|---|

**PIM TABLE D - Flagship 5: Pre-Breeding and Trait Discovery**

| <b>Year</b> | <b>Milestone description</b>   | <b>Means of verifying</b>  | <b>For which outcomes</b>  |
|-------------|--|--|--|
| 2018        | Prioritization of 2 traits in one crop for pre-breeding and identification of germplasm and cultivars to initiate pre-breeding   | 4 Publications/reports/technical bulletins   | FP5O1: Prebreeding products through use of genebanks and other sources and modern tools to increase genetic diversity in breeding programs globally  |
| 2019        | Development/refinement of technologies for overcoming barriers to wide crosses for 1 crop  | 4 Publications/reports/technical bulletins   | FP5O1: Prebreeding products through use of genebanks and other sources and modern tools to increase genetic diversity in breeding programs globally  |
| 2020        | Development/refinement of technologies for overcoming barriers to wide crosses 1 crop  | 2 Publications/reports/technical bulletins   | FP5O1: Prebreeding products through use of genebanks and other sources and modern tools to increase genetic diversity in breeding programs globally  |
| 2021        | Development of segregating populations for development of intermediate products for 1 priority traits in 1 crops   | 2 publications/reports and intermediate pre-breeding products for 1 trait in 1 crop available for breeders | FP5O1: Prebreeding products through use of genebanks and other sources and modern tools to increase genetic diversity in breeding programs globally  |
| 2022        | Development of segregating populations for development of intermediate products for 1 priority traits in 2 crops   | 2 publications, and intermediate pre-breeding products for 1 trait in 2 crops available for breeders       | FP5O1: Prebreeding products through use of genebanks and other sources and modern tools to increase genetic diversity in breeding programs globally  |
| 2022        | Characterization and selection of intermediate products in 2 traits in 2 crops and making available to breeding programs   | 2 publications/reports, intermediate pre-breeding products available for 2 traits in 2 crops for breeders  | FP5O1: Prebreeding products through use of genebanks and other sources and modern tools to increase genetic diversity in breeding programs globally  |
| 2018        | Germplasm reference sets, other germplasm sets, mapping populations assembled and traits prioritized for discovery research in 3 legumes and 3 cereals                             | 4 publications/reports/technical bulletins   | FP5O2: Trait discovery and development based on genomics and phenomics to generate new markers to support trait integration through use of modern enabling technologies and forward breeding |
| 2019        | Precision phenotyping for key traits for these collections and genotyping to identify novel alleles for 2 traits in 2 crops that have limited variability in breeding populations. | 4 publications/reports and 1 databases   | FP5O2: Trait discovery and development based on genomics and phenomics to generate new markers to support trait integration through use of modern enabling technologies and forward breeding |

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| 2020 | Marker development through a variety of genetic resources for top 2 priority traits in 3 legumes and 3 cereals.  | 8 publications/reports, diagnostic markers for 2 key traits in 6 crops, fully functional 1 databases          | FP5O2: Trait discovery and development to be based on genomics and phenomics to generate new markers to support trait integration through use of modern enabling technologies and forward breeding |
| 2021 | Promising markers are validated and those found useful are promoted to forward breeding programs as required by breeding pipelines for target GLDC countries.  | 4 publications, forward breeding a routine in 4 crops, 1 marker assisted breeding products in 2 crops         | FP5O2: Trait discovery and development based on genomics and phenomics to generate new markers to support trait integration through use of modern enabling technologies and forward breeding       |
| 2022 | The validated markers are used in forward breeding programs as required by breeding pipelines for target GLDC countries.   | 4 publications, forward breeding a routine in 5 crops, 1 marker assisted products in 3 crops                  | FP5O2: Trait discovery and development based on genomics and phenomics to generate new markers to support trait integration through use of modern enabling technologies and forward breeding       |
| 2022 | The validated markers are used in forward breeding programs in 2 major cereals and 3 major legumes as required by breeding pipelines for target GLDC countries.  | 4 publications, forward breeding a routine in 4 crops, 1 marker assisted breeding products in 3 crops         | FP5O2: Trait discovery and development based on genomics and phenomics to generate new markers to support trait integration through use of modern enabling technologies and forward breeding       |
| 2018 | All GLDC trait discovery programs migrate data to IBP, BMS, GOBII to manage genotypic and phenotypic data.   | 1 publications, and 2 fully functional databases  | FP5O3: Development of enabling technologies platforms to be used for rapid trait discovery, trait validation, trait development, and trait   |
| 2019 | Network of precision phenotyping sites is established across GLDC crops to provide unique and relevant testing locations for key traits. Gain-of-function or loss of function platform in 1 cereal and 2 legumes established | 2 publications, and 2 fully functional databases. Transgenic platform for gain or loss of function in 3 crops | FP5O3: Development of enabling technologies platforms to be used for rapid trait discovery, trait validation, trait development, and trait introgression   |
| 2020 | TILLING population developed at least in 1 cereal and 1 legume for forward and reverse genetic screens   | 2 publications and 1 TILLING population each in 2 crop available  | FP5O3: Development of enabling technologies platforms to be used for rapid trait discovery, trait validation, trait development, and trait introgression   |
| 2021 | One quality lab each at ICRISAT, IITA and ICARDA strengthened for priority nutritional quality traits of GLDC crops  | 2 nutritional labs established  | FP5O3: Development of enabling technologies platforms to be used for rapid trait discovery, trait validation, trait development, and trait introgression   |

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| 2022 | Development/refinement of technologies for development of double haploids and/or rapid generation turnover in at least one legume and one cereal. | 2 publications, proof of concept for DH in 2 crops, multiple generation per year in 2 crops | FP5O3: Development of enabling technologies platforms to be used for rapid trait discovery, trait validation, trait development, and trait introgression |
| 2022 | Capacity development of partners in using various technologies in gene discovery and breeding   | 10 training courses/workshops/conferences, 25 students trained by 2022                      | FP5O3: Development of enabling technologies platforms to be used for rapid trait discovery, trait validation, trait development, and trait introgression |