



**Results-Framework Document  
(RFD)  
for  
Indian Agricultural Research Institute  
(2012-2013)**

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# **Section-1**

## **Vision, Mission, Objectives and Functions**

### **Vision**

Generation and extension of innovative technologies to achieve food, nutrition and livelihood security with sustainable agriculture, and economic prosperity along with quality human resource development under dynamic constrained physical and economic environment in the country.

### **Mission**

The primary mission of the Institute is to explore new frontiers of science and knowledge and develop human resource to provide leadership to the country in technology development and policy guidance resulting in a vibrant, responsive and resilient agriculture which must be effectively productive, eco-friendly, sustainable, economically profitable and socially equitable.

### **Objectives**

1. Improving crop productivity and quality through conventional and molecular approaches
2. Enhancing crop production through conservation and efficient management of natural resources; and development of technologies adapted to climate change.
3. Bio security and efficient management of pests, diseases and nematodes through conventional and frontier research
4. Socio-economic & policy research, capacity building and commercialization of technologies.
5. Technological interventions for enhancing profitability through improved farm machinery, post- harvest management and value addition.
6. Development of globally competitive human resources

### **Functions**

To function on the premise that research is the engine of science-led agricultural growth. To follow the path of scientific research, technology development and extension and human resource development leading to the realization of new paradigms for achieving the congruence among enhanced productivity, sustainability, ecological and environmental security and socio-economic equity

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## Section 2:

*Inter se* Priorities among Key Objectives, Success Indicators and Targets

Objectives	Weight (%)	Actions	Success Indicators	Unit	Weight (%)	Target/Criteria value					
						Excellent	Very Good	Good	Fair	Poor	
						100%	90%	80%	70%	60%	
<b>Improving crop productivity and quality through conventional and molecular approaches.</b>	24	Evaluation of improved varieties for suitable crop husbandry practices	Number of breeding lines evaluated	Number	0.5	14160	<b>12746</b>	11330	9915	8500	
		Evaluation, characterization, registration of germplasm/variety	Number of germplasm/population characterized and evaluated	Number	0.5	9475	<b>8530</b>	7580	6635	5685	
			Number of germplasm/population/ variety registered	Number	0.5	4	<b>3</b>	2	1	0	
		Conservation/maintenance of germplasm	Plants/genetic stocks conserved in situ	Number	0.5	940	<b>850</b>	790	650	560	
			Plants/genetic stocks conserved ex- situ	Number	0.5	6940	<b>6250</b>	5555	4860	4165	
		Pre-breeding and basic activities for genetic improvement	Trait specific crosses attempted	Number	1	4200	<b>3800</b>	3370	2950	2530	
		Evaluation of nutrition, quality and productivity response	Number of varieties tested for quality/ productivity	Number	1	2300	<b>2100</b>	1860	1600	1400	
		Development of varieties/hybrids for field crops	Varieties/hybrids identified/release	Number	8	20	<b>18</b>	16	14	12	
		Production of nucleus seed	Nucleus seed produced								
			Cereals	Tonnes	0.5	34	<b>31</b>	27	24	21	
			Pulses	Quintals	0.5	116	<b>105</b>	93	87	70	
			Oil Seeds	Kgs	0.5	12	<b>11</b>	10	8	7	
			Vegetables	Kgs	0.5	8	<b>7</b>	6	5	4	
		Production of breeder seed	Breeder seed produced								
			Cereals	Tonnes	0.5	344	<b>310</b>	275	240	206	
			Pulses	Tonnes	0.5	17	<b>15</b>	13	12	10	
			Oil Seeds	Quintals	0.5	50	<b>45</b>	40	35	30	
			Vegetables	Kgs	0.5	688	<b>620</b>	550	480	410	
		Production of quality seed	Quality seed produced								
			Cereals	Tonnes	0.5	1057	<b>951</b>	845	740	630	
Pulses	Tonnes		0.5	20	<b>18</b>	16	14	12			

			Oil Seeds	Quintals	0.5	89	<b>80</b>	71	62	53
			Vegetables	Quintals	0.5	44	<b>40</b>	35	31	27
		Production of quality planting material	Quality planting material produced	Number	1	55,000	<b>50,000</b>	45,000	39,000	33,000
		Trait specific improvement through molecular breeding	Gene identified	Number	2	10	<b>9</b>	8	7	6
			Gene incorporated/validated	Number	1	20	<b>18</b>	16	14	12
			Gene sequenced and deposited in data bank	Number	1	11	<b>10</b>	9	8	7
Enhancing crop production through conservation and efficient management of natural resources; and development of technologies adapted to climate change	14	Improving nutrient use efficiency	Technologies developed/ tested and or validated	Number	2	13	<b>12</b>	11	9	8
		Development of water management technologies	Technologies developed	Number	1	10	<b>9</b>	8	7	6
			Technologies tested and or validated	Number	1	8	<b>7</b>	6	5	4
		Development of efficient production technologies	Technologies developed/ tested and validated	Number	2	13	<b>12</b>	11	9	8
		Development of technology for conservation agriculture	Technologies developed/ tested and validated	Number	1	10	<b>9</b>	8	7	6
		Characterization and improvement of soil health	Soil samples tested	Number	0.5	5880	<b>5300</b>	4700	4100	3500
			Technologies tested and validated	Number	1	6	<b>5</b>	4	3	2
		Strategies/technologies for mitigation / adaptation of Climate Change effects and promoting carbon sequestration	Technologies developed/ tested and validated	Number	2	11	<b>10</b>	9	8	7
		Strategies/technologies for waste water management	Technologies developed/ tested and validated	Number	1	5	<b>4</b>	3	2	1
Technologies for protected agriculture, dry land and precision farming	Technologies for protected agriculture, dry land and precision farming	Number	2	8	<b>7</b>	6	5	4		
Development of DSS/SDSS for planning and forecasting	Simulation models developed/validated and advisories issues	Number	0.5	4	<b>3</b>	2	1	0		
Bio security and efficient management of pests, diseases and nematodes through conventional and frontier research	9	Development of agrochemicals including nano-formulations, safety evaluation and quality control	Molecules/formulations, developed/ evaluated	Number	3	7	<b>6</b>	5	4	3
		Development of bio-control technologies/ strategies	Technologies developed tested and validated	Number	2	13	<b>12</b>	11	9	8
		Development of IPM Technologies	Pest dynamics worked out/technologies developed and or validated	Number	1.5	6	<b>5</b>	4	3	2
		Development of diagnostics	Technologies developed/ tested/ validated	Number	1	16	<b>14</b>	12	11	9
		Collection, evaluation, and characterization of/ new pest population	New pest population collected/ characterized	Number	1	3444	<b>3100</b>	2750	2400	2060
		Gene sequencing of pathogen and pests	Gene sequenced and deposited in data bank	Number	0.5	44	<b>40</b>	35	31	27
Socio-economic & policy research, capacity building and commercialization of technologies	15	Policy research in agriculture	Policy documents prepared	Number	0.5	3	<b>2</b>	1	0	0
		Impact assessment	Commodities covered	Number	0.5	4	<b>3</b>	2	1	0
		S strategies and models in extension	Strategies/models developed	Number	1	5	<b>4</b>	3	2	1
		Transfer of knowledge	Capacity building of farmers, extension professionals and other stakeholders	Number	2	24200	<b>21804</b>	19400	17000	14500
		Advisory service (including, farmers contacted in melas).	Farmers contacted/advised	Number	2	183000	<b>165000</b>	146000	128000	110000
		Empowerment of rural women	Farm women skill developed	Number	2	1830	<b>1650</b>	1470	1280	1100
		Organization of demonstration	Demonstration organized	Numbers	2	3300	<b>3000</b>	2600	2300	2000
		Products/Processes development and commercialization	Products/Processes developed and commercialized	Number	2	11	<b>10</b>	9	8	7

			Patents filed/copyrights registered	Number	1.5	5	<b>4</b>	3	2	1
			Business incubation	Number	0.5	5	<b>4</b>	3	2	1
			Revenue generated	Rs.(lakh)	1	144	<b>130</b>	115	100	86
Technological interventions for enhancing profitability through improved farm machinery, post- harvest management and value addition	6	Development of design/implements/ technology/machinery	Designs developed and tested/validated	Number	1.5	3	<b>2</b>	1	0	0
		Development of post harvest technologies	Technologies developed/ tested and or validated	Number	3	5	<b>4</b>	3	2	1
		Development of nutraceuticals and value added food products	Protocols standardized/process developed	Number	1.5	3	<b>2</b>	1	0	0
Development of globally competitive human resources	20	M.Sc. Programme	No. of students admitted	Number	3	128	<b>115</b>	102	89	77
			No of students awarded degrees	Number	3	111	<b>100</b>	89	78	67
		Ph.D Programme	No. of students admitted	Number	3	142	<b>128</b>	114	100	85
			No of students awarded degrees	Number	3	83	<b>75</b>	67	58	50
		AHRD trainings & offshore support	No of trainings conducted	Number	2	20	<b>18</b>	16	14	12
			No of participants trained	Number	3	361	<b>325</b>	289	253	217
			Faculty provided advance trainings	Number	1.5	44	<b>40</b>	36	31	27
International/National Seminar/workshop etc. organised	Number	1.5	27	<b>24</b>	21	19	16			
Efficient Functioning of the RFD System	3	Timely submission of RFD for 2012-13	On-time submission	Date	2	23/03/12	<b>26/03/12</b>	27/03/12	28/03/12	29/03/12
		Timely submission of Results for 2012-13	On-time submission	Date	1	01/05/13	<b>02/05/13</b>	03/05/13	06/05/13	07/05/13
Administrative reforms	5	Implement mitigating strategies for reducing potential risk of corruption	% of Implementation	%	2	100	<b>95</b>	90	85	80
		Implementation of ISO 9001	Prepare ISO 9001 action plan	Date	1	04/06/12	<b>05/06/12</b>	06/06/12	07/06/12	08/06/12
			Percent implementation	%	2	100	<b>95</b>	90	85	80
Improving Internal Efficiency /responsiveness service delivery of Ministry /Department	4	Implementation of Sevottam	Independent Audit of Implementation of citizen's charter	%	2	100	<b>95</b>	90	85	80
			Independent Audit of Implementation of public grievances redressal system	%	2	100	<b>95</b>	90	85	80

## Section 3:

## Trend Values of the Success Indicators

Objectives	Actions	Success Indicators	Unit	Actual value for FY 10/11	Actual value for FY 11/12	Targeted Value for FY 12/13	Projected Value for FY 13/14	Projected Value for FY 14/15	
Improving crop productivity and quality through conventional and molecular approaches.	Evaluation of improved varieties for suitable crop husbandry practices	Number of breeding lines evaluated	Number	11605	16215 <sup>1</sup>	12746	12880	12950	
	Evaluation, characterization, registration of germplasm/variety	Number of germplasm/population characterized and evaluated	Number	8499	8525	8530	8550	8600	
		Number of germplasm/population/ variety registered	Number	2	2	3	4	5	
	Characterization and evaluation of novel and beneficiary micro-organisms	Microorganisms identified/isolates/ characterized/resistered	Number	82	112 <sup>2</sup>	85	90	95	
	Conservation/maintenance of germplasm	Plants/genetic stocks conserved in situ	Number	646	950 <sup>3</sup>	850	900	950	
		Plants/genetic stocks conserved ex- situ	Number	4395	5990	6250	6300	6350	
	Pre-breeding and basic activities for genetic improvement	Trait specific crosses attempted	Number	3186	4030	3800	3900	4000	
	Evaluation of nutrition, quality and productivity response	Number of varieties tested for quality/ productivity	Number	2382 <sup>4</sup>	2625 <sup>4</sup>	2100	2156	2200	
	Development of varieties/hybrids for field and horticultural crops	Varieties/hybrids identified/ released	Number	33 <sup>5</sup>	21 <sup>5</sup>	18	19	20	
	Production of Nucleus seed	<i>Nucleus seed produced</i>							
		Cereals	Tonnes	28	30	31	33	35	
		Pulses	Quintals	100	100	105	110	115	
		Oil Seeds	Kgs	10	10	11	12	13	
		Vegetables	Kgs	5	5	7	8	10	
	Production of Breeder seed	<i>Breeder seed produced</i>							
		Cereals	Tones	285	300	310	325	350	
		Pulses	Tones	9	18 <sup>6</sup>	15	16	17	
		Oil Seeds	Quintals	39	43	45	47	50	
		Vegetables	Kgs	600	600	620	650	700	
	Production of quality seed	<i>Quality seed produced</i>							
		Cereals	Tonnes	848	930	951	1065	1160	
		Pulses	Tonnes	10	17	18	23	24	
		Oil Seeds	Quintals	66	75	80	87	95	
Vegetables		Quintals	33	35	40	44	45		

	Production of quality planting material	Quality planting material produced	Number	<b>38,000</b>	<b>45,000</b>	<b>50,000</b>	<b>55,000</b>	<b>60,000</b>
	Trait specific improvement through molecular breeding	Gene identified	Number	<b>6</b>	<b>20<sup>7</sup></b>	<b>9</b>	<b>10</b>	<b>11</b>
		Gene incorporated/validated	Number	<b>9</b>	<b>18<sup>8</sup></b>	<b>18</b>	<b>19</b>	<b>20</b>
		Gene sequenced and deposited in data bank	Number	<b>8</b>	<b>28<sup>9</sup></b>	<b>10</b>	<b>11</b>	<b>12</b>
Enhancing crop production through conservation and efficient management of natural resources; and development of technologies adapted to climate change	Improving Nutrient Use Efficiency	Technologies developed/ tested and or validated	Number	<b>8</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
	Development of Water management technologies	Technologies developed	Number	<b>6</b>	<b>9</b>	<b>9</b>	<b>10</b>	<b>11</b>
		Technologies tested and or validated	Number	<b>8</b>	<b>6</b>	<b>7</b>	<b>10</b>	<b>11</b>
	Development of efficient production technologies	Technologies developed/ tested and or validated	Number	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
	Development of technology for conservation agriculture	Technologies developed/tested and or validated	Number	<b>4</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>
	Characterization and improvement of soil health	Samples tested	Number	<b>5140</b>	<b>5150</b>	<b>5300</b>	<b>5350</b>	<b>5400</b>
		Technologies tested and or validated	Number	<b>3</b>	<b>6</b>	<b>5</b>	<b>6</b>	<b>7</b>
	Strategies/technologies for mitigation / adaptation of Climate Change Effects and promoting carbon sequestration	Technologies developed/ tested and validated	Number	<b>5</b>	<b>8</b>	<b>10</b>	<b>12</b>	<b>14</b>
	Strategies/technologies for waste water management	Technologies developed/ tested and or validated	Number	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
Technologies for protected agriculture, dry land and precision farming	Technologies developed tested and or validated	Number	<b>7</b>	<b>7</b>	<b>7</b>	<b>8</b>	<b>9</b>	
Development of DSS/SDSS for planning and forecasting	Simulation models developed/validated and advisories issues	Number	<b>5<sup>9</sup></b>	<b>6<sup>10</sup></b>	<b>3</b>	<b>4</b>	<b>5</b>	
Bio security and efficient management of pests, diseases and nematodes through conventional and frontier research	Development of agrochemicals including nano-formulations, safety evaluation and quality control	Molecules/formulations, developed/ evaluated/ validated	Number	<b>5</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
	Development of bio-control technologies/strategies	Technologies developed tested and validated	Number	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
	Development of IPM Technologies	Pest dynamics worked out/technologies developed/ tested and or validated	Number	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
	Development of diagnostics	Technologies developed/ tested/ validated	Number	<b>73<sup>11</sup></b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
	Collection, evaluation, and characterization of/ new pest population	New pest population collected/ characterized	Number	<b>5762<sup>11</sup></b>	<b>3515<sup>11</sup></b>	<b>3100</b>	<b>3150</b>	<b>3200</b>
	Gene sequencing of pathogen and pests	Gene sequenced and deposited in data bank	Number	<b>39</b>	<b>160<sup>12</sup></b>	<b>40</b>	<b>45</b>	<b>50</b>
Socio-economic & policy research, capacity building and commercialization of technologies	Policy research in agriculture	Policy documents prepared	Number	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
	Impact assessment	Commodities covered	Number	<b>1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
	Development of strategies and models in extension	Strategies/models developed/tested	Number	<b>3</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
	Transfer of knowledge	Capacity building of farmers, extension professionals and other stakeholders	Number	<b>19626</b>	<b>19950</b>	<b>21804</b>	<b>22805</b>	<b>23500</b>
	Advisory service (including farmers contacted in melas).	Farmers contacted/advised	Number	<b>134191</b>	<b>160200</b>	<b>165000</b>	<b>170000</b>	<b>185000</b>
	Empowerment of rural women	Farm women skill developed	Number	<b>1098</b>	<b>1800<sup>18</sup></b>	<b>1650</b>	<b>1850</b>	<b>1900</b>
	Organization of demonstration	Demonstration organized	Numbers	<b>2930</b>	<b>3742<sup>13</sup></b>	<b>3000</b>	<b>3200</b>	<b>3500</b>
	Products/Processes development and commercialization	Products/Processes developed and commercialized	Number	<b>15<sup>14</sup></b>	<b>18<sup>14</sup></b>	<b>10</b>	<b>12</b>	<b>14</b>
		Patents filed/copyright registered	Number	<b>2</b>	<b>9<sup>14</sup></b>	<b>4</b>	<b>5</b>	<b>6</b>
Business incubation		Number	<b>5</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	

		Revenue generated	Rs.(lakh)	93	125	130	135	140
Technological interventions for enhancing profitability through improved farm machinery, post- harvest management and value addition	Development of design/implements/ technology/machinery	Designs developed and tested/machinery validated	Number	1	2	2	3	4
	Development of post harvest technologies	Technologies developed/ tested and validated	Number	0	3	4	5	6
	Development of nutraceuticals and value added food products	Protocols standardized/process developed/commercialized	Number	0	2	2	4	5
Development of globally competitive human resources	M.Sc. Programme	No. of students admitted	Number	110	108	115 <sup>15</sup>	115 <sup>15</sup>	120
		No of students awarded degrees	Number	99	120	100	105	110
	Ph.D Programme	No. of students admitted	Number	128 <sup>15</sup>	128 <sup>15</sup>	128 <sup>15</sup>	128 <sup>15</sup>	130 <sup>15</sup>
		No of students awarded degrees	Number	73	82	75	80	85
	AHRD Trainings & offshore support	No of trainings conducted	Number	25 <sup>16</sup>	17	18	19	20
		No of participants trained	Number	527 <sup>16</sup>	315	325	340	360
		Scientists provided advance trainings	Number	45 <sup>17</sup>	31	40	45	50
International/National Seminar/workshop etc. organized		Number	24	22	24	26	28	
Efficient Functioning of the RFD System	Timely submission of RFD for 2012-13	On-time submission	Date	06/04/2011	12/03/12	26/03/12		
	Timely submission of Results for 2012-13	On-time submission	Date	06/04/2011	01/05/12	02/05/13		
Administrative reforms	Implementation of ISO 9001	Prepare ISO 9001 action plan	Date	-	-	05/06/12		
		Implementation of ISO 9001 action plan	%	-	-	95		
	Implement mitigating strategies for reducing potential risk of corruption	% implementation	%	-	-	95		
Improving Internal Efficiency /responsiveness service delivery of Ministry /Department	Implementation of Sevottam	Independent Audit of Implementation of citizen's charter	%	-	-	95		
		Independent Audit of Implementation of public grievances redressal system	%	-	-	95		

### Justification:

- 1 It was an exceptional year and large number of breeding lines were received for evaluation
- 2 High value was due to specific externally funded project
- 3 More germplasm material was received
- 4 High values obtained in 2010-11 and 2011-12 due to an external project.
- 5 High figures were due to backlog of varieties ready for release
- 6 Off-season seed production of green gram cv.Pusa Vishal was undertaken to bridge the shortfall of previous year
- 7 The figures were high as there was specific time-bound project for this purpose
- 8 A large number of scientists were trained to use this technology
- 9 The figures were high due to specific project undertaken as above.
- 10 The figures were high due to targets of National Fellow and NAIP projects now completed.



- 11 Specific cess fund project on rice pests was in-operation during this period
- 12 Figure was high due to targets in time-bound NAIP project on this aspect
- 13 NGO programme was expanded for demonstration during this period, hence figures were high
- 14 Figures were high due to ZTMU project under NAIP
- 15 Number of seats is fixed, however, it is expected that the quota for OBC will be increased from 18% to 27% in 2014-15
- 16 From 2010-2011, ICAR has restricted the number of applications for summer / winter school training
- 17 The professional societies conduct trainings to the scientists in far flung areas for the benefit of scientists.
- 18 A special programme on training of farm women on value addition of flowers was conducted during the year.

## **Section 4:**

### **Description and Definition of Success Indicators and Proposed Measurement Methodology**

#### **Objective 1**

With respect to objective -1, the following are the success indicators to measure the outcome. Number of breeding lines evaluated (for field and horticultural crops), varieties tested for quality/productivity (varieties of all crops tested), germplasm/population collected/introduced (all crops), germplasm /population characterized and evaluated(all crops), germplasm/population/ variety registered(all crops), plants/genetic stocks conserved in situ (Horticultural crops), plants/genetic stocks conserved ex- situ (all crops), trait specific crosses attempted (all crops), varieties/hybrids identified (all crops), varieties/hybrids released (all crops), quantity of Nucleus, Breeders, and Quality seed produced(for Cereals, Pulses, Oil Seeds and Vegetables and flowers), number of quality planting material produced (Horticultural crops), number of genes identified, incorporated/validated, and number of genes sequenced and deposited in data bank.

#### **Objective 2**

Number of technologies developed and tested/validated for various activities viz., INM, water management, increase production, conservation agriculture, improvement of soil health, protected agriculture, GHG and promoting carbon sequestration, and waste water management are the success indicators for this objective. The term tested/validated here refers to the developed technologies to be tested and validated before the final release of the same to the end users.

#### **Objective 3**

Success indicators under this objective are - number of technologies developed, tested and validated for agrochemicals including nano-formulations, bio-control strategies, IPM, diagnostics, pest dynamics worked out, number of new pest population collected, characterized and evaluated and registered, genes sequenced, sequences deposited in data bank, and Nano formulations developed /validated.

#### **Objective 4**

The success indicators under this objective are- number of policies recommended, crops covered under market intelligence, extension modules developed, capacity building/skill development of farmers/ farm women, demonstration organized, simulation models developed/validated, products/processes developed and commercialized, patents filed, business incubated, and revenue generated(in Rs. lakhs).

#### **Objective 5**

The success indicators under this objective are – number of designs developed and tested, farm machinery validated and commercialized, number of technologies developed, tested and validated for post-harvest management and value addition, number of protocols standardized, processes developed/commercialized for nutraceuticals and value added foods, technologies developed for drying, milling, and packaging

#### **Objective 6**

The success indicators under this objective are - number of M.Sc. and Ph.D students admitted, number of M.Sc. and Ph.D students awarded degrees, trainings conducted, number of International/National Seminar, Conferences organized, number of faculty provided advance trainings .

## Section 5:

### Specific Performance Requirements from other departments

In order to meet all the objectives of RFD of IARI the institute needs funds for modern equipments infrastructure facility, practical training of staff, quality genetic material (of field and hort. crops), and for dissemination of technologies developed and validated in respect of soil health, irrigation water, environment natural resources, crop protection etc. The accomplishment of all above/depends on performance as well as response of various organization and departments concerned.

Supply of various equipments depends on suppliers' performance, development of infrastructural facilities will depend on public agencies / contractors' performance whom contract is given, purchases/ procurement of various research materials depend on timely payment of financing agency/ organization to IARI, timely installation of major equipments will depend on performance of the task whom contract is given or the company concerned. The specific points are given below:

1. IARI requires time-bound project based funds from various national and international organization like Planning Commission, DBT, DST, DADF, NHB, DAC, MoEF, CMERI, Basmati Export Development Foundation, NABARD, NHB, DRDO, NMPB, APEDA, MoRD, MoHFA, MoWR, MoFP, MHRD, CGIAR institute, FAO and other sources through international agreements etc. Flexibility in fund use in the projects is also required.
2. The genetic material for high productivity, quality, tolerance against biotic, abiotic stress etc. are required from National and International Organization like NBPGR, CIMMYT, other CGIAR institute and other national or international repositories. Simplified and user-friendly guidelines for exchange of material will help achieve targets faster
3. The transfer of technologies developed and validated in respect of crop protection, machinery, processes, and soil health, water use, conservation of natural resources, advisory services to stake holders will depend on performance of the agencies engaged in dissemination services of State Agriculture department, State Marketing department, NGOs, KVKs, SHGs, Farmers' Associations and various institutes given responsibility.
4. Technical linkage with other R&D Departments such as DST, DBT, CSIR Institutes, MOE&F, SAUs, CG Institutes and foreign universities will be needed for fast-track progress.
5. In order to achieve targets in time-bound manner and taking the technologies to the end user, flexibility and freedom to foster partnership with public/private sector industries are needed

## Results-Framework Document (RFD) for Indian Agricultural Research Institute, New Delhi (2012-2013)

### Section 6:

#### Outcome /Impact of Institute

Outcome /Impact of Institute	Jointly responsible for influencing this outcome/ impact with the following department (s)/Ministry(ies)	Success Indicators	Unit	2010/11	2011/12	2012/13	2013/14	2014/15
Improvement in crop productivity and quality through conventional and molecular breeding approaches	NRCPB, DAC, DST, DBT, BARC, DRDO, PPV&FRA, CIMMYT, ICRISAT, ICARDA, University of Sydney, Biodiversity International	Trait specific improvement of genetic material (crosses made)	Number	3186	4030	3800	3900	4000
		New varieties of field and horticultural crops identified/released	Number	33	21	18	19	20
		Nucleus seed produced	Tonnes	38	40	41	44	46
		Breeder seed produced	Tonnes	298	323	330	346	372
		Quality seed produced	Tonnes	868	958	981	1101	1198
		Planting material produced	Number	38,000	45,000	50,000	55,000	60,000
Frontier research in biochemical/physiological processes for enhanced crop productivity	NRCPB. DST, DBT	Genes identified	Number	6	20	9	10	11
		Genes incorporated	Number	9	18	18	19	20
Improvement in soil health, eco sustainable natural resource management and production technologies for different agro-eco systems	DBT, DST, DAC, NCPA, CMERI, IPNI, PPIC, Space Application Centre, Ahmedabad, CRIDA, MoWR,	Technology for improvement of soil health developed	Number	3	4	5	6	7
		Soil samples tested	Number	5140	5150	5300	5350	5400
		Water management technologies developed	Number	8	6	7	10	11
		Technology developed for conservation agriculture developed	Number	4	8	9	10	11
		Technology developed for waste water management	Number	2	3	4	5	6
		Improved nutrient use efficiency technologies developed	Number	8	11	12	13	14
		Technologies for protected agriculture, dry land and precision farming developed	Number	7	7	7	8	9

		Strategies/technologies developed for mitigation / adaptation of climate change effects and promoting carbon sequestration	Number	5	8	10	12	14
Reduction in yield losses in crops due to pests and diseases	DBT, DST, DAC NRCPB, NCIPM, NRDC, MoEF	Agrochemicals/nano-formulations, developed/ evaluated and or validated	Number	5	5	6	7	8
		Development of diagnostics	Number	73	13	14	15	16
		Pest dynamics worked out/IPM technologies tested and or validated	Number	3	4	5	6	7
		Bio control strategies/ technologies tested and or validated	Number	10	11	12	13	14
Reduction in post-harvest losses and enhanced value addition	MOFPI	Technologies for Post- harvest management and value addition developed	Number	0	3	4	5	6
Improved and affordable farm machinery and protected agriculture	CMERI, Basmati Export Development Foundation	Designs/farm machines developed/tested and or validated	Number	1	2	2	3	4
Human resource development in teaching and research	DAC, Members of NARS	Students awarded M.Sc. degree	Number	99	120	100	105	110
		Students awarded. Ph.D degree	Number	73	82	75	80	85
		Number of trainings conducted	Number	25	17	18	19	20
		No of participants trained	Number	527	315	325	340	360
Policies and improvement in rural livelihood security	KVKs, SAUs, NGOs, DAC, NABARD	Economic policies developed	Number	1	2	2	2	2
		Demonstrations conducted	Number	2930	3742	3000	3200	3500
		Capacity building of farmers, extension professionals and other stakeholders	Number	19,626	19,950	21,804	22,805	23,500
		Farm women skill developed	Number	1098	1800	1650	1850	1900
		Farmers contacted/advised	Number	1,34,191	1,60,200	1,65,000	1,70,000	1,85,000
Commercialization of technologies	BIRAP, NRDC, Private and public industries	Products/Processes developed and commercialized	Number	15	18	10	12	14
		Patents filed	Number	2	9	4	5	6
		Business incubation	Number	5	3	4	5	6
		Revenue generated	Rs.(lakh)	93	125	130	135	140