

# **Results-Framework Document (RFD) For**



**Central Institute for Research on Buffaloes  
Hisar-125001, Haryana**



**(April 2011 –March 2012)**

# **Results-Framework Document (RFD)**

**Central Institute for Research on Buffaloes, Hisar: April 2011 – March 2012**

## **Section 1: Vision, Mission, Objectives and Functions**

### **The Vision:**

To develop and propagate high yielding elite buffalo germplasm for quality milk and meat production while retaining inherent draughtability across different regions of the country

### **The Mission**

To improve buffalo through identification, conservation and propagation of elite germplasm having high efficiency of reproduction and nutrient utilization for sustainable production and commercialization

### **Objectives**

- 1 To promote and undertake research on all aspects of buffalo production
- 2 To establish nucleus breeding herds of important buffalo breeds
- 3 To acts as a repository of information on all aspects of buffalo production and development
- 4 To collaborate with national and international institutes in the area of buffalo research and development
- 5 To undertake extension activities for technology transfer

### **Functions**

To promote and undertake research in all aspect of buffalo production and transfer of technology. Genetic improvement associated progeny testing, performance recording, certified semen production, freezing and faster multiplication of superior germplasm involving biotechnological tools. Improvement of production, reproduction, nutrient utilization and buffalo husbandry practices to economize buffalo productivity through All India Network Project on Buffalo Improvement in collaboration with SAUs/SVUs and other national institutions and establish linkages with international agencies and dissemination of developed technologies.

**Section-2**  
**Inter se priorities among key objectives, success indicators and targets**

Objectives	Weight	Action	Success Indicators	Unit	Weight	Target/Criteria Value				
						Excellent 100%	Very Good 90%	Good 80%	Fair 70%	Poor 60%
Buffalo genetic improvement through conventional and molecular approach	34	Genomics/phenomics studies in buffaloes	Recording and updating of phenomics data for identified resource families.	Number	5	800	700	600	500	400
			Collection of genetic material blood/tissue (DNA), semen (DNA)	Number	4	100	80	70	60	50
			Milk samples (traits analysis)	Number	3	800	700	600	500	400
			Rumen microbial metagenomics study for fibre digestion and methanogenesis by microbial community DNA sequencing	Number	4	100	90	80	70	60
			2-D electrophoresis analysis for mastitis/ pregnancy biomarkers	Number	2	6	5	4	3	2
			Cytokine and gene expression in udder health	Number	2	10	9	8	7	6
		Improvement in production and reproduction in Murrah and Nili-Ravi herd	Lactation yield in Murrah	Kg	3	2250	2150	2000	1950	1900
			Calving interval in Murrah	Days	2	460	470	480	500	520
			Calf motility in Murrah	%	2	5	6	8	9	10
			Lactation yield in Nili-Ravi	Kg	3	1900	1850	1800	1750	1700
			Calving interval in Nili-Ravi	Days	2	480	500	510	520	530
Calf motility in Nili-Ravi	%	2	5	5.5	6	6.5	7			
Buffalo progeny testing programme	21	Selection and test mating of 13 <sup>th</sup> set of bulls and progeny testing of 8 <sup>th</sup> set of bull	Selection of bull on the basis of pedigree records, semen and physical parameters	Date	4	30.06.2011	31.07.2011	31.08.2011	30.09.2011	31.10.2011
			Evaluation and selection of proven bulls of 8 <sup>th</sup> set	Date	4	31.05.2011	30.06.2011	31.07.2011	31.08.2011	30.09.2011
		Distributing the semen to all the participating centres and coordination of network unit and fund release	Distribution of semen for test mating	Date	3	30.06.2011	15.07.2011	31.07.2011	15.08.2011	30.08.2011
			Release of 1 <sup>st</sup> half of funds to the network centres	Date	3	31.07.2011	31.08.2011	30.09.2011	31.10.2011	30.11.2011
		Dissemination of superior germplasm through production of disease free semen doses for AI	Semen doses production/ bull	Number	3	5000	4500	4000	3500	3000
			Number of AI in field	Number	4	4000	3500	3300	3000	2500
Faster multiplication of superior germplasm through intervention of reproductive tools	14	To prepare the competent donors cells for fusion and activation of mature oocytes	Process standardization	Date	1	30.06.2011	31.10.2011	30.11.2011	31.12.2011	31.01.2012
		IVM, fusion of oocytes and culture to the blastocysts stage.	No of oocytes matured <i>in-vitro</i> and subject to fusion followed by development to blastocysts stage	Number	3	100	90	80	70	60
		Transfer of cloned blastocysts to recipients	Cloned blastocysts transfer to recipients	Number	2	10	5	3	2	1
		Integrated MOET & SOET	MOET & SOET flushing for embryo	Number	5	40	35	30	28	25

		for faster multiplication of elite buffalo germplasm	recovery								
		Quality improvement and assessment of cryopreserved buffalo semen	Assessment of integrity of sperm plasma membrane acrosome and DNA	Number	3	40	35	30	28	25	
Technology showcasing through extension activities	10	Organization of buffalo mela, calf rallies, infertility treatment camps and training programme	Extension and transfer of technology	Number	6	15	14	12	10	9	
		Publication of scientific information on buffaloes	Annual report	Date	2	31.06.2011	15.7.2011	30.08.2011	15.09.2011	31.10.2011	
			Development of buffalopedia	Date	2	31.08.2011	30.09.2011	15.10.2011	31.10.2011	15.11.2011	
Improving/upgrading/creation of new infrastructure in the Institute	5	Modern animal shed	Completion of civil work of the shed	Date	2	31.01.2012	15.02.2012	28.02.2012	15.03.2012	31.03.2012	
		Installation of deep tube well	Water channel to irrigate agri. field/sprinkler	Date	2	31.07.2011	31.08.2011	30.09.2011	31.12.2011	31.03.2012	
		Electrification of the agri. field	Electricity line for agriculture farm	Date	1	31.05.2011	30.06.2011	31.07.2011	30.09.2011	31.012.2011	
Economising buffalo production system and value addition	5	Establishment of buffalo broiler unit at field	Production of buffalo broiler in field	Number	2	5	4	3	2	1	
		Soil reclamation and green fodder production	Green fodder produced	Quintals	2	40,000	38,000	36,000	33,000	30,000	
		Silage making	Silage made	Quintals	1	5,000	4,500	4,000	3,500	3,000	
Efficient functioning of the RFD system	3	Timely submission of draft for approval	On-time submission	Date	2	10.06.2011	14.06.2011	16.06.2011	20.06.2011	22.06.2011	
		Timely submission of results	On-time submission	Date	1	01.05.2012	03.05.2012	04.05.2012	05.05.2012	06.05.2012	
Improving internal efficiency / responsiveness / service delivery of Ministry / Department	8	Finalize a strategic plan for next five year plan	Strategic plan document for the next five year will be prepared	Date	2	10.12.2011	15.12.2011	20.12.2011	24.12.2011	31.12.2012	
		Identify potential areas of corruption related to organization activity and develop an action plan to mitigate them	Identify potential areas of corruption if any and Develop an action plan to mitigate corruption	Date	2	10.12.2011	15.12.2011	20.12.2011	24.12.2011	31.12.2012	
		Implementation of sevottam									
		(a) Create a savottam compliant system to implement, monitor and review citizen's charter	Implementation of savottam system	Date	2	10.12.2011	15.12.2011	20.12.2011	24.12.2011	31.12.2012	
(b) Create a sevottam compliant system to redress and monitor public grievances	Independent audit of implementation of grievance redress mechanism	Date	2	10.12.2011	15.12.2011	20.12.2011	24.12.2011	31.12.2012			

### Section 3: Trend Values of the Success Indicators

Objectives	Action	Success Indicators	Unit	Actual Value for FY 09/10	Actual value for FY 10/11	Target value for FY 11/12	Projected Value for FY 12/13	Projected Value for FY 13/14
Buffalo genetic improvement through conventional and molecular approach	Genomics/phenomics studies in buffaloes	Recording and updating of phenomics data for identified resource families.	Number	-	1000	700	800	800
		Collection of genetic material blood/tissue (DNA) semen (DNA)	Number			80	-	-
		Milk samples (traits analysis)	Number	-	2000	700	-	-
		Rumen microbial metagenomics study for fibre digestion and methanogenesis by microbial community DNA sequencing	Number	-	50	90	50	50
		2-D electrophoresis analysis for mastitis/ pregnancy biomarkers	Number	-	-	5	7	8
		Cytokine and gene expression in udder health	Number	-	-	9	12	-
	Improvement in production and reproduction in Murrah and Nili-Ravi herd	Lactation yield in Murrah	Kg	1995	2274	2150	2300	2350
		Calving interval in Murrah	days	520	480	470	450	450
		Calf motility in Murrah	%	8.45	5	6	4.5	4.5
		Lactation yield in Nili-Ravi	Kg	1822	-	1850	2000	2100
		Calving interval in Nili-Ravi	days	478	500	500	460	460
Calf motility in Nili-Ravi	%	3.1	4.39	5.5	4.5	4.5		
Buffalo progeny testing programme	Selection and test mating of 13 <sup>th</sup> set of bulls and progeny testing of 8 <sup>th</sup> set of bull	Selection of bull on the basis of pedigree records, semen and physical parameters	Date	-	-	31.07.2011	01.01.2013	30.06.2014
		Evaluation and selection of proven bulls of 8 <sup>th</sup> set	Date	-	-	30.06.2011	31.07.2012	31.12.2013
	Distributing the semen to all the participating centres and coordination of network unit and fund release	Distribution of semen for elite/ test mating	Date	-	-	15.07.2011	31.12.2012	31.05.2014
		Release of 1 <sup>st</sup> half of funds to the network centres	Date	-	-	31.08. 2011	31.07.2012	31.07.2013
	Dissemination of superior germplasm through production of disease free semen doses and AI	Semen doses production/ bull	Number	2510	5689	4500	5500	6000
		Number of AI in field	Number	2803	3419	3500	4500	5000
Faster multiplication of superior germplasm through intervention of reproductive tools	To prepare the competent donors cells for fusion and activation of mature oocytes	Process standardization	Date	-	-	31.10.2011	-	-
	IVM, fusion of oocytes and culture to the blastocysts stage.	No of oocytes matured <i>in-vitro</i> and subject to fusion followed by development to blastocysts stage	Number	-	-	90	100	100
	Transfer of cloned blastocysts to recipients	Cloned blastocysts transfer to recipients	Number	-	-	5	10	10
	Integrated MOET & SOET	MOET & SOET flushing for embryo	Number	-	18	35	40	-

	for faster multiplication of elite buffalo germplasm	recovery						
	Quality improvement and assessment of cryopreserved buffalo semen	Assessment of integrity of sperm plasma membrane acrosome and DNA	Number	-	25	35	-	-
Technology showcasing through extension activities	Organization of Buffalo mela, calf rallies, infertility treatment camps and training programme	Extension and transfer of technology	Number	23	13	14	15	15
	Publication of scientific information on buffaloes	Annual report	Date	-	-	15.07.2011	31.05.2012	31.05.2013
Improving/upgrading/creation of new infrastructure in the Institute	Modern animal shed	Completion of civil work of the shed	Date	-	-	15.02.2012	-	-
	Installation of deep tub well	Water channel to irrigate agri.field/sprinkler	Date	-	-	31.08.2011	-	-
	Electrification of the agri field	Electricity line for agriculture farm	Date	-	-	30.06.2011	-	-
Economising buffalo production system and value addition	Establishment of buffalo broiler unit at field	Production of buffalo broiler in field	Number	-	-	4	6	6
	Soil reclamation and green fodder production	Green fodder produced	Quintals	29427	37304	38,000	45000	50000
	Silage making	Silage made	Quintals	8242	5000	4,500	5500	6000
Efficient functioning of the RFD system	Timely submission of draft for approval	On-time submission	Date			10.06.2011		
	Timely submission of results	On-time submission	Date			01.05.2012		
Improving internal efficiency / responsiveness / service delivery of Ministry / Department	Finalize a strategic plan for next five year plan	Strategic plan document for the next five year will be prepared	Date			10.12.2011		
	Identify potential areas of corruption related to organization activity and develop an action plan to mitigate them	Identify potential areas of corruption if any and develop an action plan to mitigate corruption	Date			10.12.2011		
	Implementation of sevottam							
	(a) Create a savottam compliant system to implement, monitor and review citizen's charter	Implementation of savottam system	Date			10.12.2011		
(b) Create a sevottam compliant system to redress and monitor public grievances	Independent audit of implementation of grievance redress mechanism	Date			10.12.2011			

## Section: 4

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

**Objective 1:** For animal selection through genomic studies, phenomics data of identified resource families shall be recorded. Real time PCR will be carried out for cytokine and gene expression quantification. 2-D electrophoresis analysis for pregnancy and mastitis biomarkers shall be studied. Rumen microbial metagenomics study will be carried out by PCR amplification of rumen community DNA and sequencing for fibre digestion and methanogenesis. The 305 days lactation yield, caving interval and calf mortality for Murrah and Nili-Ravi breed will be improved with cumulative inputs.

**Objective 2:** Under the buffalo progeny testing programme selection and test mating of 13<sup>th</sup> set and progeny testing of 8<sup>th</sup> set of bull will be carried out on the basis of pedigree records. The progeny tested semen for test mating and funds for the 1<sup>st</sup> half will be distributed to all the participating centres of the buffalo network project. Semen of the progeny tested/selected bulls will be cryopreserved and used/distributed for insemination in the field.

**Objective 3:** In the programme under faster multiplication of superior germplasm through cloning, it is proposed to prepare and freeze competent donor cells. Oocytes shall be matured and cloned embryos shall be cultured and transferred to the recipients. Integrated MOET/ SOET shall be second programme for faster multiplication in which donor buffaloes shall be flushed after single/multiple ovulations. Resultant embryos will be transferred into the synchronized recipients and surplus embryos will be frozen. To improve the freezability of the buffalo semen integrity of sperm and its biometry, acrosome and DNA integrity will be studied.

**Objective 4:** Extension activities like buffalo mela and calf rallies shall be organized with public private partnership. For improving the reproductive efficiency in buffaloes infertility treatment camps will be organized in association with other agencies. Training on buffalo husbandry will be organized for rural youths.

**Objective 5:** The modern animal shed construction is in progress and completion of civil work is proposed in the stipulated time. The soil reclamation programme will help in increasing the fodder area in the Institute agriculture farm.

**Objective 6:** Raising buffalo calves economically with better management will add to the profit of buffalo entrepreneurs. Green fodder supply and value addition to it is very essential for the overall buffalo production system.

## **Section 5:**

### **Specific Performance Requirement from other Departments**

1. Semen freezing/ artificial insemination and embryo transfer technology will be popularized and will have greater acceptability with the support of state development agencies.
2. Procurements of electroporator machine is essential for the cloning programme
3. Financial support from ICAR headquarter will be very important to meet the objectives.
4. Modern automatic animal shed for 200 buffaloes is under construction and the cooperation of CPWD is desired.
5. Timely completion of the physical structure by the CPWD.
6. Propagation of technologies by line department.

## Section 6: Outcome/impact of activities of organization ministry

S.No	Outcome/impact of activities of organization/ RCs	Jointly responsible for influencing this outcome/ impact with the following organization (s)/ departments / ministry (ies)	Success indicator	Unit	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
1	Improvement in the productivity through quality germplasm production, evaluation and dissemination	Buffalo network centres, CIRB, State and Central Agriculture University, Deptt. Of various state govt.	Bull evaluated by test mating	Number	14	11	12	15	15
			Frozen semen doses produced	Number	30137	55576	50000	50000	50000
			Semen doses disseminated to the field	Number	65316	59646	60000	60000	60000
			Bull disseminated	Number	3	5	6	8	10
2	Testing of bulls based on the production performance of progenies born out of AI in the field for breed improvement	Network centres, state line department, private agencies and progressive farmers	Progenies born in the field	Number	971	1279	1400	1500	1600
3	Improvement through elite mating to increase the genetic gain in buffalo productivity at Institute's animal farm	CIRB	Wet average	Kg	7.01	7.45	7.50	7.55	7.60
			305 days lactation yield	Kg	1995	2247	2250	2300	2350
			Calving interval	Days	520	492	460	460	450
4	Strengthening of human resource in AI and buffalo husbandry training programme and demonstration of technology developed by the Institute	CIRB, SAU's, State AHD, NGOs, ATMA, PNB Farmers training centres	Persons trained	Number	112	120	120	130	130
			Visitors	Number	865	676	500	600	600

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