वार्षिक प्रतिवेदन
2022-23

AICRP ON POULTRY BREEDING AND POULTRY SEED PROJECT

Annual Report 2022-23

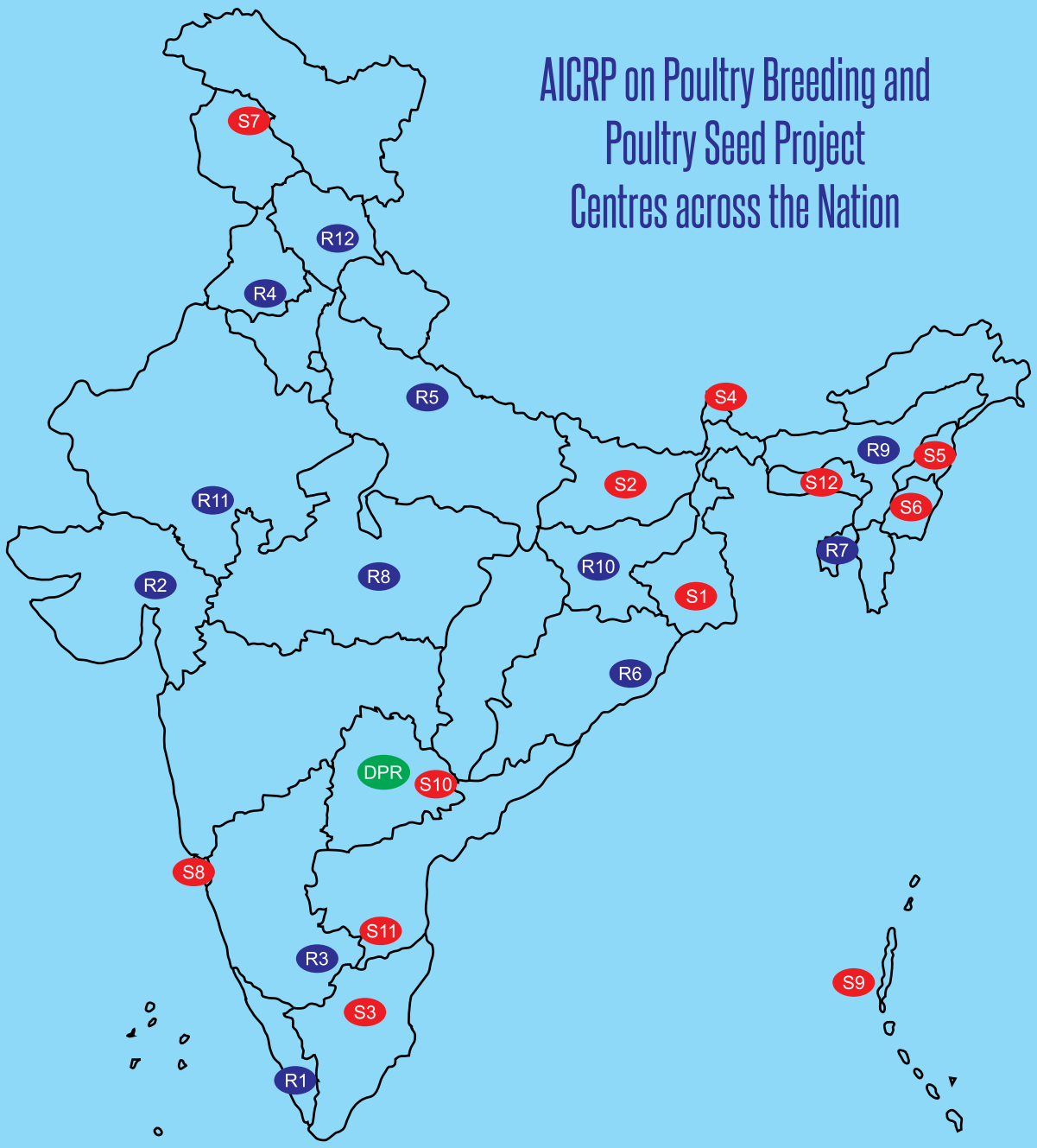
भाकृअनुप - कुक्कुट अनुसंधान निदेशालय

ICAR-DIRECTORATE OF POULTRY RESEARCH

ISO 9001-2015

Rajendranagar, Hyderabad-500 030, Telangana, India

AICRP on Poultry Breeding and Poultry Seed Project Centres across the Nation



ICAR - DPR

AICRP Centres	
R1	KVASU, Mannuthy
R2	AAU, Anand
R3	KVAFSU,Bengaluru
R4	GADVASU, Ludhiana
R5	ICAR-CARI, Izatnagar
R6	OUAT, Bhubaneswar
R7	ICAR-RCNEH, Agartala
R8	NDVSU, Jabalpur
R9	AAU, Guwahati
R10	BAU, Ranchi
R11	MPUAT, Udaipur
R12	CSKHPKVV, Palampur

PSP Centres	
S1	WBUAFS, Kolkata
S2	BASU, Patna
S3	TANUVAS, Hosur
S4	ICAR-RCNEH, Gangtok
S5	ICAR-RCNEH, Jharnapani
S6	ICAR-RCNEH, Imphal
S7	SKUAST, Srinagar
S8	ICAR-CCARI, Goa
S9	ICAR-CIARI, Port Blair
S10	PVNRTVU, Warangal
S11	SVVU, Tirupati
S12	ICAR-RC for NEHR, Barapani

AICRP on Poultry Breeding and Poultry Seed Project

Annual Report 2022-23

भाकृअनुप- कुक्कुट अनुसंधान निदेशालय

ICAR-Directorate of Poultry Research

ISO 9001:2015

Rajendranagar, Hyderabad - 500 030, Telangana, India

www.pdonpoultry.org

https://aicrp.icar.gov.in/poultry

AICRP ON PB AND PSP ANNUAL REPORT 2022-23

Correct Citation

Annual Report 2022-23. AICRP on Poultry Breeding and Poultry Seed Project, ICAR-Directorate of Poultry Research, Rajendranagar, Hyderabad-500 030, Telangana, India. pp 120.

Published by

Dr. R.N. Chatterjee,
Director

Compilation and Editing

AICRP on Poultry Breeding	**Poultry Seed Project**
Dr. Santosh Haunshi	Dr. M. Shanmugam
Dr. L. Leslie Leo Prince	Dr. M. Niranjan
Dr. U. Rajkumar	Dr. Vijay Kumar
	Dr. S.V. Rama Rao

Hindi Translation: Mr. J. Srinivas Rao

Front Cover
A pair of *Toqbari* birds

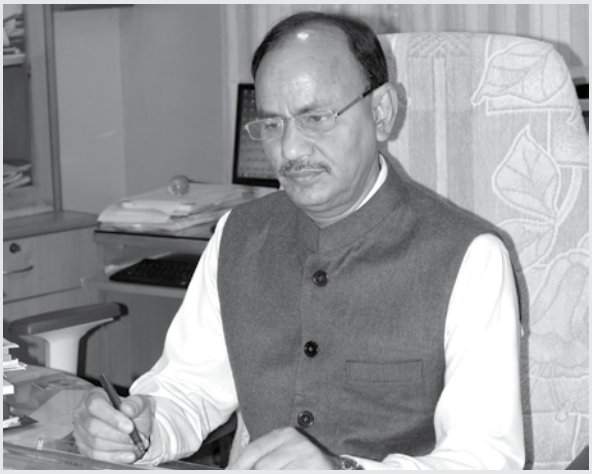
Inside Front Cover
Location of AICRP on Poultry Breeding and Poultry Seed Project centres

Inside Back Cover
ICAR-DPR Building

Back Cover
Hon'ble Union Minister for Agriculture and Farmers' Welfare distributing chicks to a tribal farmer at Nagaland centre

Designed & Printed at
Entire Printers
Lakdi-ka-pul, Hyderabad, Telangana - 500 004

Preface



The ICAR-Directorate of Poultry Research, a premier organization under the aegis of the Indian Council of Agricultural Research mandated to conduct research in frontier areas of poultry production in the country. The Directorate is coordinating and monitoring twelve centres of the All India Coordinated Research Project on Poultry Breeding and Poultry Seed Project each. It gives me immense pleasure to present the Annual Report of AICRP on Poultry Breeding and Poultry Seed Project for the year 2022-23.

The AICRP on Poultry Breeding is aimed at developing and propagating location-specific rural chicken varieties suitable for the prevailing conditions in different parts of the country. Besides, the elite layer and broiler pure lines developed earlier are being maintained and improved for economic traits and used in the development of location-specific varieties. Recently, the major emphasis was given to the work on conservation, characterization of native chicken breeds and their utilization in the development of location-specific varieties in different centres of the AICRP on Poultry Breeding. Twelve Poultry Seed Project centres spread across the country are in operation to increase the availability of improved germplasm throughout the country and get feedback from farmers for further improvement in the performance of pure lines. The untiring efforts of all the staff of AICRP on Poultry Breeding and Poultry Seed Project lead to the effective propagation of improved varieties of chicken for backyard poultry farming in the country.

During this year the Tripura Centre of the AICRP on Poultry Breeding developed a new location-specific variety (*Toqbari*). A total of ten success stories have been documented during the year 2022-23 from different centres of AICRP and PSP. During the year a total of 9.76 lakhs of improved chicken germplasm has been distributed to the farmers across the country from different centres of AICRP on Poultry Breeding and Poultry Seed Project. An amount of Rs. 345.77 lakhs revenue was generated by supplying the improved chicken germplasm.

I am extremely grateful to Dr. Trilochan Mohapatra (Former Secretary, DARE and Director General, ICAR) and Dr. Himanshu Pathak, Secretary, DARE and Director General, ICAR for all the support and encouragement extended for the effective functioning of the AICRP on Poultry Breeding and PSP. I am thankful to Dr. Bhupendra Nath Tripathi, Deputy Director General (Animal Science), for his keen interest and guidance. I am thankful to the Secretary, ICAR and Financial Adviser, ICAR for their continuous support to the Directorate. I am thankful to Dr. V.K. Saxena, ADG (AP&B) and other scientific and administrative staff of the ICAR (HQ) for extending help from time to time. The research progress achieved could not have been possible without the support and contribution of the scientists of AICRP and PSP cell at the Institute and all the PIs of AICRP and PSP centres, who deserve due appreciation. I also thank all other staff for supporting the scientists in their research endeavours. I also thank the editorial committee for bringing out this report in an appreciable manner.

Date: 01-09-2023

(R.N. Chatterjee)
Director

Abbreviations

AFE	Age at first egg
ASM	Age at sexual maturity in days
BW16	Body weight at 16 weeks of age
BW40	Body weight at 40 weeks of age
BW64	Body weight at 64 weeks of age
BW72	Body weight at 72 weeks of age
EP40	Egg production number up to 40 weeks of age
EP64	Egg production number up to 64 weeks of age
EP72	Egg production number up to 72 weeks of age
EW28	Egg weight at 28 weeks of age
EW40	Egg weight at 40 week of age
EW64	Egg weight at 64 weeks of age
EW72	Egg weight at 72 weeks of age
FCR	Feed conversion ratio
FES	Fertile eggs set
Gen.	Generation
HH	Hen housed
HD	Hen day
S	Survivors'
TES	Total eggs set
Wks	Weeks

Contents

Chapter No.	Chapter	Page No.
1	Executive Summary (Hindi)	1
2	Executive Summary	5
3	Budget	9
	AICRP on Poultry Breeding	
4	History	10
5	Technical Programme	12
6	**Performance appraisal of AICRP centres**	16
	i. KVASU, Mannuthy	16
	ii. AAU, Anand	23
	iii. KVAFSU, Bengaluru	29
	iv. GADVASU, Ludhiana	34
	v. OUAT, Bhubaneswar	40
	vi. ICAR-CARI, Izatnagar	42
	vii. CSKHPKVV, Palampur	44
	viii. MPUAT, Udaipur	49
	ix. ICAR-RC NEH, Agartala	52
	x. AAU, Guwahati	57
	xi. NDVSU, Jabalpur	61
	xii. BAU, Ranchi	65
7	Control Populations, ICAR-DPR, Hyderabad	67
8	Critical Observations	71

Contents

Chapter No.	Chapter	Page No.
	Poultry Seed Project	
9	History	78
10	Technical Programme	79
11	**Performance appraisal of PSP centres**	
	i. BASU, Patna	80
	ii. ICAR-RC NEH, Jharnapani	82
	iii. ICAR-RC NEH, Gangtok	84
	iv. ICAR-RC NEH, Imphal	86
	v. TANUVAS, Hosur	88
	vi. ICAR-CCARI, Goa	90
	vii. ICAR-CIARI, Port Blair	92
	viii. ICAR RC for NEH Region, Umiam	93
	ix. SKUAST, Srinagar	95
	x. SVVU, Tirupati	96
	xi. PVNRTVU, Warangal	98
12	Critical Observations	100
13	Success Stories	102
14	Proceedings of AICRP & PSP Annual Review Meeting and action taken report	111
15	Publications	117
16	Address of Centres	119

1 कार्यकारी सारांश

कुक्कुट प्रजनन पर अखिल भारतीय समन्वित अनुसंधान परियोजना

यहां दर्शाए गए केंद्रों पर संचालित की जा रही सफल परियोजनाओं में से एक है। केवीएएसयू, मन्नुथी; एएयू, आनंद; केवीएएफएसयू, बेंगलुरु; जीएडीवीएएसयू, लुधियाना; ओयूएटी, भुवनेश्वर; भाकृअनुप-सीएआरआई, इज़्ज़तनगर; एनईएच क्षेत्र, अगरतला के लिए भाकृअनुप आरसी; एनडीवीएसयू, जबलपुर; एएयू, गुवाहाटी; बीएयू, रांची; एमपीयूएटी, उदयपुर; एवं सीएसकेएचपीकेवीवी, पालमपुर। परियोजना का मुख्य उद्देश्य स्थान विशिष्ट कुक्कुट किस्मों का विकास, स्थानीय देशी, विशिष्ट लेयर और ब्रायलर जर्मप्लाज्म का संरक्षण, सुधार, लक्षण वर्णन और अनुप्रयोग, ग्रामीण कुक्कुट पालन और ग्रामीण, आदिवासी और पिछवाड़े क्षेत्रों में उद्यमिता के लिए प्रथाओं के पैकेज का विकास करना है। केवीएएसयू, मन्नुथी, और एएयू, आनंद केंद्र दो विशिष्ट लेयर जर्मप्लाज्म (IWN और IWP) को बनाए रखने के लिए हैं। केवीएएफएसयू , बेंगलुरु, और जीएडीवीएएसयू , लुधियाना, ओयूएटी , भुवनेश्वर, भाकृअनुप -सीएआरआई, इज़्ज़तनगर को कुल चार (प्रत्येक केंद्र द्वारा दो) विशिष्ट ब्रॉयलर जर्मप्लाज्म (PB-1, PB-2, CSML और CSFL) बनाए रखना है।

यादृच्छिक वंशावली नस्ल नियंत्रण जीवों (एक लेयर के लिए और दूसरी ब्रॉयलर के लिए) को भाकृअनुप-कुक्कुट अनुसंधान निदेशालय, हैदराबाद में बनाए रखा गया। आनुवंशिक प्रगति को मापने के लिए इन जीवों से अंडे सेने के नमूने कुक्कुट प्रजनन पर एआईसीआरपी के विभिन्न केंद्रों को भेजे जा रहे हैं। परिषद द्वारा लिए गए निर्णय के अनुसार, विभिन्न एआईसीआरपी केंद्रों और भाकृअनुप-डीपीआर में बनाए गए नस्लों को विभिन्न एआईसीआरपी केंद्रों पर दोहराया गया ताकि आपात स्थिति के मामले में और केंद्र द्वारा तीन और चार मार्गीय संकर के उत्पादन के लिए संसाधन जीवों के रूप में उपयोग किया जा सके। विभिन्न एआईसीआरपी केंद्रों पर दोहराए जाने वाले नस्लों आईडब्ल्यूडी और आनंद में आईडब्ल्यूके हैं। वर्ष के दौरान विभिन्न केंद्रों से किसानों को कुल **6,05,064** कुक्कुट जर्मप्लाज्म वितरित किए गए । उन्नत कुक्कुट जर्मप्लाज्म के वितरण और प्रसार से रूपए **211.57** लाख की राशि का राजस्व उत्पन्न हुआ।

वर्ष 2022-23 में कुक्कुट प्रजनन पर एआईसीआरपी, मन्नुथी केंद्र , केवीएएसयू ने 28 सप्ताह की आयु तक देशी कुक्कुट जर्मप्लाज्म की एस-7 पीढ़ी का मूल्यांकन किया। 28 सप्ताह की आयु में अंडे का वजन 40.10 ग्राम था जो पिछली पीढ़ी की तुलना में 0.46 ग्राम अधिक है। यौन परिपक्वता की आयु पिछली पीढ़ी की तुलना में 17.38 दिन पहले रही। केंद्र ने 72 सप्ताह की आयु तक व्हाइट लेगॉर्न के IWN और IWP उपभेदों की S-33 पीढ़ी का भी मूल्यांकन किया है। 72 सप्ताह की आयु तक कुक्कुटों के अंडे का उत्पादन IWN में 323.70 और IWP नस्लों में 318.03 रहा। चालू वर्ष के दौरान जर्मप्लाज्म आपूर्ति से केंद्र ने रूपए 16.49 लाख का राजस्व अर्जित किया और कुल 68,220 जर्मप्लाज्म की आपूर्ति की है। लाभान्वित किसानों की संख्या 625 रही।

एएयू, आनंद केंद्र ने 40 सप्ताह की आयु तक की अंकलेश्वर नस्ल के कुक्कुट की एस-3 पीढ़ी का मूल्यांकन किया । 40 सप्ताह की आयु तक अंकलेश्वर कुक्कुट (एस-3 जीन) का अंडा उत्पादन 83.31 अंडे था, जो एस-2 पीढ़ी (81.5) की तुलना में अधिक रहा। अंकलेश्वर कुक्कुट की एस-4 पीढ़ी का उत्पादन किया गया और इसका मूल्यांकन किया जा रहा है। IWN और IWP उपभेदों की S-3 पीढ़ी का मूल्यांकन 40 सप्ताह की आयु तक किया गया। 40 सप्ताह की आयु तक अंडे का उत्पादन IWN में 121.1 और IWP नस्लों में 126.6 अंडे रहा। IWD और IWK उपभेदों की S-10 पीढ़ी का मूल्यांकन 40 सप्ताह की आयु तक किया गया। 40 सप्ताह की आयु तक अंडे का उत्पादन आईडब्ल्यूके नस्लों (102 अंडे) की तुलना में आईडब्ल्यूडी (109.8) में अधिक रहा। आनंद कृषि विश्वविद्यालय (गुजरात) को एनबीएजीआर, करनाल से अंकलेश्वर नस्ल के कुक्कुट के लिए नस्ल संरक्षण पुरस्कार - 2022 (संस्थान पुरस्कार) प्राप्त हुआ। केंद्र ने समीक्षाधीन अवधि के दौरान कुल 43,146 जर्मप्लाज्म की आपूर्ति की है। इससे कुल 824 किसान लाभान्वित हुए। रिपोर्टिंग वर्ष के दौरान केंद्र ने रूपए 29,08 लाख का राजस्व अर्जित किया।

बेंगलुरु केंद्र ने वर्ष के दौरान देशी कुक्कुट, पीबी-1 और पीबी-2 वंशावलियों और उनके संकरों का मूल्यांकन किया। पांच सप्ताह का शरीर का वजन क्रमशः पीबी-1 और पीबी-2 वंशावलियों में 1082 और 1017 ग्राम रहा। पीबी-1 और पीबी-2 वंशावलियों में 40 सप्ताह की आयु तक अंडे का उत्पादन क्रमशः 37.41 और 29.43 अंडे रहा। मादाओं में 8, 20, 40 और 52 सप्ताह की आयु में देशी कुक्कुट (एस-6) का शरीर का वजन क्रमशः 248.8, 1067, 1273 और 1389 ग्राम रहा। 40, 52 और 72 सप्ताह की आयु में कुक्कुट के अंडे का उत्पादन 22.10, 27.05 और 49.67 अंडे रहा। 40 सप्ताह की आयु में देशी कुक्कुट के अंडे का वजन 42.10 ग्राम रहा। पीबी-1 में 5-सप्ताह के शरीर के वजन की फेनोटाइपिक और आनुवंशिक प्रतिक्रिया क्रमशः 7.88 और 20.61 ग्राम रही और पीबी-2 में संबंधित मान क्रमशः 4.34 और 12.98 ग्राम रहा। कुल 310 किसानों को 1,68,535 कुक्कुट जर्मप्लाज्म वितरित किए गए। वर्ष के दौरान केंद्र ने रूपए 44.37 लाख का राजस्व अर्जित किया।

लुधियाना केंद्र ने वर्ष के दौरान पंजाब ब्राउन, पीबी-1 और पीबी-2 वंशावलियों और दोहरे उद्देश्य वाले संकरों का मूल्यांकन किया। पांच सप्ताह का शरीर का वजन क्रमशः पीबी-1 और पीबी-2 वंशावलियों में क्रमशः 1.90 और 1.88 की एफसीआर 1190 और 1094 ग्राम के साथ 40 सप्ताह की आयु तक अंडे का उत्पादन क्रमशः पीबी-1 और पीबी-2 वंशावलियों में 65.14 और 70.63 रहा। पंजाब ब्राउन में 8-सप्ताह के शरीर का वजन मुर्गों में 691.5 ग्राम और मादाओं में 633.3 ग्राम था और एफसीआर 3.8 रहा। पंजाब ब्राउन में 52 सप्ताह की आयु तक अंडे का उत्पादन 110.7 अंडे रहा। 36 सप्ताह की आयु में अंडे का वजन 55.25 ग्राम रहा। दोहरे संकर (पीबी-2 x पंजाब ब्राउन) का फार्म मूल्यांकन किया गया और 8 सप्ताह में 841.2 ग्राम तक पहुंच गया। 52 सप्ताह की आयु तक अंडे का उत्पादन संकर में 145 अंडे रहा। केंद्र ने 363 किसानों को 87,364 जर्मप्लाज्म वितरित कर रूपए 29.11 लाख का राजस्व अर्जित किया।

भुवनेश्वर केंद्र को देशी हंसली , सीएसएमएल और सीएसएफएल वंशावलियों का मूल्यांकन करने का काम सौंपा गया है। हंसली कुक्कुट की एस-1 पीढ़ी के कुल 182 अच्छे चूजे उत्पन्ना हुए। हंसली में 8 और 20 सप्ताह की आयु में शरीर का वजन क्रमशः 603.26 और 1583 ग्राम रहा। हंसली कुक्कुट में 40 और 52 सप्ताह की आयु में कुक्कुट के एक दिन के अंडे का उत्पादन 25.22 और 34.36 अंडे रहा। सीएसएफएल और सीएसएमएल में 5 सप्ताह की आयु में शरीर का औसत वजन क्रमशः 1018 और 1123 ग्राम रहा। सीएसएफएल और सीएसएमएल में 40 सप्ताह की आयु तक अंडे का उत्पादन 64.31 और 61.55 अंडे रहा। केंद्र ने 371 किसानों को 7,827 जर्मप्लाज्म की आपूर्ति कर रूपए 1.40 लाख की आय का राजस्व प्राप्त किया।

भाकृअनुप-सीएआरआई केंद्र ने स्थानीय देशी कुक्कुट (एस-7) जर्मप्लाज्म का मूल्यांकन किया और 998 अच्छे चूजे उत्पन्ना हुए। सीएसएमएल, सीएसएफएल और नियंत्रण वंशावलियों के कुल 2205, 2257 और 651 अच्छे चूजे उत्पन्ना किए गए। सीएसएमएल, सीएसएफएल और नियंत्रण वंशावलियों में 5 सप्ताह की आयु में शरीर का वजन क्रमशः 1257, 1242 और 669.8 ग्राम रहा। एस-19 पीढ़ी के दौरान सीएसएमएल, सीएसएफएल और नियंत्रण वंशावलियों में 40 सप्ताह तक कुक्कुट अंडे का उत्पादन क्रमशः 67.18, 68.40 और 56.50 अंडे रहा। 23 किसानों और अन्य हितधारकों को कुल 16,138 जर्मप्लाज्म की आपूर्ति की गई।

अगरतला (त्रिपुरा) केंद्र ने वर्ष के दौरान त्रिपुरा ब्लैक, डेहलेम रेड, सीएसएफएल और उनके संकरों का मूल्यांकन किया। बीएनडी संकर के ई-6 मूल्यांकन क्षेत्र और खेत की परिस्थितियों में 72 सप्ताह के अंडे का उत्पादन क्रमशः 159.3 और 138.8 अंडे रहा। बीएनडी संकर का ई-7 मूल्यांकन क्षेत्र में 52 सप्ताह तक और खेत की परिस्थितियों में 40 सप्ताह तक पूरा किया गया। बीएनडी संकर के ई-7 मूल्यांकन के दौरान, 52 सप्ताह के अंडे का उत्पादन क्षेत्र में 93.35 और खेत की परिस्थितियों में 40 सप्ताह की आयु तक 54.12 अंडे रहा। E7 में दर्ज की गई यौन परिपक्वता की आयु पिछले (E6) मूल्यांकन की तुलना में कुछ अधिक रही। 549 ग्रामीण किसानों के लिए कुक्कुट पालन पर कुल 13 प्रशिक्षण कार्यक्रम आयोजित किये गये। 623 किसानों को कुल 19,081 कुक्कुट जर्मप्लाज्म की आपूर्ति कर रूपए 10.70 लाख की राजस्व प्राप्त की गयी।

जबलपुर केंद्र ने 7 सप्ताह से 72 सप्ताह की आयु तक जबलपुर रंगीन और कड़कनाथ की जी-2 जीवों का मूल्यांकन किया । जबलपुर रंगीन के 20, 40, 52 और 72 सप्ताह की आयु में शरीर का वजन क्रमशः 1536, 2003, 2140 और 2761 ग्राम रहा। जबकि, कड़कनाथ कुक्कुटों का वजन इसी आयु में 1123, 1514, 1690 और 2016 ग्राम था। जबलपुर रंगीन कुक्कुट 155 दिनों में परिपक्व होते हैं जबकि कड़कनाथ 167 दिनों की आयु होते हैं। 40, 52 और 72 सप्ताह की आयु तक जबलपुर रंगीन कुक्कुट एक दिवस के अंडे का उत्पादन क्रमशः 99.80, 162.0 और 248.6 अंडे था, जबकि संबंधित आयु में कड़कनाथ नस्ल के कुक्कुट एक दिवस के अंडे का उत्पादन 64.0, 94.4 और 118.1 अंडे रहा। 8 और 20 सप्ताह की आयु में नर्मदानिधि का शारीरिक वजन नर कुक्कुटों में 1010 और 1506 ग्राम और मादा कुक्कुटों के लिए 725 और 1384 ग्राम रहा, जबकि क्षेत्र की परिस्थितियों में 8 और 20 सप्ताह की आयु में नर्मदानिधि का वजन 772 और 1436 ग्राम , नर कुक्कुटों में 687 और मादा कुक्कुटों में 1206 ग्राम रहा। क्षेत्र में पालन के तहत 52 सप्ताह की आयु तक नर्मदानिधि का अंडा उत्पादन 93.2 अंडे रहा और अंडे का वजन 48.5 ग्राम रहा। इस दौरान रूपए 14.69 लाख की राजस्व प्राप्तियों के साथ 440 किसानों को कुल 34,978 कुक्कुट जर्मप्लाज्म वितरित किए गए । परियोजना के टीएसपी घटकों के तहत 8 प्रशिक्षणों में कुल 160 एसटी लाभार्थियों को प्रशिक्षित किया गया।

वर्ष के दौरान मेवाड़ी, सीएसएफएल, आरआईआर और प्रतापधन जीवों का मूल्यांकन किया गया। मेवाड़ी मादाओं में 40 सप्ताह की आयु में शरीर का वजन 1680 ग्राम रहा। मेवाड़ी नस्ल के कुक्कुटों में 52 सप्ताह की आयु तक अंडे का उत्पादन 53.13 अंडे रहा। प्रतापधन में वार्षिक अंडा उत्पादन (72 सप्ताह की आयु तक) 162.5 रहा। समीक्षाधीन अवधि के दौरान छह प्रशिक्षण कार्यक्रम आयोजित किए गए, जिससे परियोजना के टीएसपी घटक के तहत 300 आदिवासी किसानों को लाभ हुआ। चालू वर्ष के दौरान लगभग 769 किसानों को कुल 41,836 उन्नत कुक्कुट जर्मप्लाज्म वितरित किए गए। जर्मप्लाज्म के वितरण से केंद्र को रूपए 12.09 लाख प्राप्त हुए। रिपोर्ट अवधि के दौरान चार शोध पत्र प्रकाशित किए गए।

पालमपुर केंद्र ने वर्ष के दौरान देशी कुक्कुट जर्मप्लाज्म की जी-10 पीढ़ी , डेहलेमरेड की जी-9 पीढ़ी और हिमसमृद्धि का मूल्यांकन किया गया। 72 सप्ताह की आयु तक देशी कुक्कुटों का एचडीईपी और एचएचईपी क्रमशः 111.7 और 119.6 रहा। 40 और 52 सप्ताह की आयु में अंडे का वजन क्रमशः 46.15±0.20 और 49.24±0.15 ग्राम रहा। डेहलेमरेड में 52 सप्ताह की आयु तक एचएचईपी और एचडीईपी क्रमशः 131.6 और 144.2 रहा। 40 और 52 सप्ताह की आयु में अंडे का वजन क्रमशः 52.40±0.26 और 55.33±0.10 ग्राम रहा। डेहलेमरेड x नेटिव कुक्कुटों के लिए 52 सप्ताह की आयु तक एचएचईपी और एचडीईपी क्रमशः 102.5 और 108.6 रही। हिमसमृद्धि कुक्कुटों के लिए 52 सप्ताह की आयु तक एचएचईपी और एचडीईपी क्रमशः 113.9 और 119.3 रही। वर्ष के दौरान केंद्र ने जनजातीय क्षेत्रों सहित राज्य के विभिन्न क्षेत्रों में 661 किसानों को 60,149 चूजों/पेरेंटों की आपूर्ति की। चालू वर्ष के दौरान केंद्र को रूपए 27.32 लाख राजस्व की प्राप्ति हुई।

गुवाहाटी केंद्र ने 72 सप्ताह की आयु तक की मूल डहलेमरेड, दाओथिगीर और बीएन जीवों का मूल्यांकन किया। कामरूपा का मूल्यांकन क्षेत्र और खेत की परिस्थितियों में 72 सप्ताह की आयु तक किया गया। सभी झुंडों की औसत प्रजनन क्षमता 89.36% पाई गई। सभी पंक्तियों में ब्रूडिंग और विकास अवधि के दौरान मृत्यु दर 4.64% से कम रहा। 5 सप्ताह के शरीर का वजन स्वदेशी में 185.8 ग्राम और डेहलेमरेड में 445.6 ग्राम रहा। मूल जीवों में 72 सप्ताह तक अंडे का वजन और अंडे का उत्पादन क्रमशः 42.10 ग्राम और 112.1 अंडे रहा। डेहलेमरेड में अंडे के उत्पादन में 0.2 अंडे का सुधार हुआ। पांच सप्ताह के शरीर का वजन 390.8 ग्राम रहा और बीएन संकर में एफसीआर 2.90 रहा। कामरूप झुंड में पहले अंडे की आयु क्षेत्र में 148.6 दिन और खेत में 169.4 दिन रहा। 40, 52 और 72 सप्ताह की आयु तक कुक्कुट अंडे का उत्पादन फार्म में 51.30, 92.90 और 155.70 अंडे रहा और क्षेत्र में संबंधित मूल्य क्रमशः 45.60, 75.80 और 124.60 अंडे रहा। दाओथिगिर के लिए यौन परिपक्वता की आयु 198.2 दिन रही। 72 सप्ताह की आयु तक कुक्कुट के अंडे का उत्पादन 116.7 अंडे रहा। 72 सप्ताह में अंडे का वजन 36.80 ग्राम रहा। चालू वित्तीय वर्ष के दौरान केंद्र ने 250 किसानों को 26,874 जर्मप्लाज्म की आपूर्ति कर रूपए 6.16 लाख राजस्व प्राप्त किया।

रांची केंद्र ने 72 सप्ताह की आयु तक मूल जीवों की जी-10 पीढ़ी का मूल्यांकन किया। झारसिम (ई-10) का मूल्यांकन 72 सप्ताह तक किया गया। देशी में प्रजनन क्षमता 87.60 और झाड़सिम संकर में 97.22% रही। दोनों जर्मप्लाज्मों में प्रजनन क्षमता में साधारण सुधार हुआ। उपजाऊ सेट किए अंडों पर सेने की क्षमता देशी में 75.76 और झारसिम संकर में 88.94% रही। जी-10 के दौरान मूल जीवों में 72 सप्ताह तक कुक्कुट के अंडे का उत्पादन 144.43 अंडे रहा और पिछली पीढ़ी की तुलना में इसमें साधारण सुधार हुआ। झारसिम (ई-10) में 72 सप्ताह की आयु तक फार्म कंडिटिनो में कुक्कुट के अंडे का उत्पादन 170.94 अंडे रहा। ई-11 मूल्यांकन के दौरान झारसिम में एक दिन और 4 सप्ताह की आयु में शरीर का वजन बेहतर रहा। केंद्र ने 116 किसानों, केवीके, गैर सरकारी संगठनों और अन्य एजेंसियों को 30,916 जर्मप्लाज्म की आपूर्ति की। चालू वित्त वर्ष के दौरान केंद्र को रूपए 2.47 लाख की प्राप्ति हुई।

2022-23 के दौरान जर्मप्लाज्म आपूर्ति एवं राजस्व सृजन

केंद्र	जर्मप्लाज्म आपूर्ति (संख्या)	उत्पन्न राजस्व (लाख रूपये में)	किसानों की संख्या
केवीएएसयू, मन्नुथी	68,220	16.49	625
एएयू, आनंद	43,146	29.08	824
केवीएएफएसयू , बेंगलुरु	168,535	44.37	310
जीएडीवीएएसयू , लुधियाना	87,364	29.11	363
ओयूएटी, भुवनेश्वर	7,827	1.40	371
भाकृअनुप-सीएआरआई, इज्जतनगर	16,138	17.69	23
एनडीवीएसयू, जबलपुर	34,978	14.69	440
सीएसकेएचपीकेवीवी, पालमपुर	60,149	27.32	661
भाकृअनुप-आरसी, अगरतला	19,081	10.70	623
एएयू, गुवाहाटी	26,874	6.16	250
एमपीयूएटी, उदयपुर	41,836	12.09	769
बीएयू, रांची	30,916	2.47	116
कुल	**6,05,064**	**211.57**	**5375**

कुक्कुट बीज परियोजना

कुक्कुट बीज परियोजना (पीएसपी) हमारे देश के दूरदराज क्षेत्रों में ग्रामीण कुक्कुट जर्मप्लाज्म की उपलब्धता बढ़ाने के उद्देश्य से विकसित की गई। इस प्रयास में, भारतीय कृषि अनुसंधान परिषद ने 11वीं पंचवर्षीय योजना के दौरान छह केंद्रों, तीन पूर्वोत्तर क्षेत्र में एवं तीन विभिन्न राज्य पशु चिकित्सा/कृषि विश्वविद्यालयों में "कुक्कुट बीज परियोजना" आरंभ की है। 12वीं योजना के दौरान अपने संबंधित क्षेत्रों में किसानों की आवश्यकताओं को पूरा करने के लिए पांच और केंद्र जोड़कर इस परियोजना को सुदृढ़ किया गया । वर्तमान में यह परियोजना देशभर में 12 केंद्रों पर संचालित की जा रही है। इस परियोजना का मुख्य उद्देश्य उन्नत कुक्कुट जर्मप्लाज्म (उपजाऊ अंडे, एक दिन की आयु के चूजे और वयस्क चूजे) का स्थानीय उत्पादन करना और ग्रामीण कुक्कुट उत्पादन को बढ़ाने के लिए अंडे और मांस के उत्पादन में वृद्धि को लक्षित करने हेतु दूरदराज के क्षेत्रों में विभिन्न हितधारकों को आपूर्ति करना है, सामाजिक लक्षित समूहों की आर्थिक स्थिति और छोटे पैमाने के कुक्कुट उत्पादकों को संगठित बाजार से जोड़ना है।

यह निदेशालय केंद्रों की गतिविधियों का समन्वय और निगरानी करता है ताकि वे प्रत्येक केंद्र के लिए निर्धारित लक्ष्यों को प्राप्त करने में सक्षम हो सकें। वर्ष 2022-23 के दौरान मुख्य भूमि और उत्तर-पूर्व केंद्रों के लिए चूजों की आपूर्ति का लक्ष्य विभिन्न केंद्रों के लिए प्रति वर्ष 0.5 से 1.0 लाख चूजों के बीच रहा और पिछवाड़े पालन की स्थितियों के तहत जर्मप्लाज्म के प्रदर्शन पर प्रतिक्रिया एकत्र करना था। कुल 3,71,419 उन्नत कुक्कुट किस्मों को उनके संबंधित क्षेत्रों/राज्यों में वितरित कर वर्ष के दौरान रूपए 134.2 लाख राजस्व की प्राप्ति हुई है।

वनराजा पेरेंटों के एक बैच का पालन-पोषण पटना केंद्र में किया गया। वर्ष 2022-23 के दौरान बिहार में किसानों को कुल 55,367 वाणिज्यिक कुक्कुट जर्मप्लाज्म वितरित कर रूपए 18.81 लाख की राजस्व राशि प्राप्त की।

वनराजा और श्रीनिधि का एक-एक जत्था झरनापानी केंद्र में तैनात था, वर्ष 2022-23 के दौरान नागालैंड और पड़ोसी राज्यों के किसानों को कुल 61,368 उन्नत कुक्कुट जर्मप्लाज्म वितरित किए गए। झरनापानी केंद्र के पीएसपी के तहत कुल रु.34.09 लाख का राजस्व प्राप्त हुआ।

वनराजा पेरेंटों के दो बैचों का पालन-पोषण सिक्किम केंद्र में किया गया। सिक्किम में किसानों को वनराजा के कुल 56,485 उन्नत कुक्कुट जर्मप्लाज्म वितरित किए गए। केंद्र ने रूपए 14.02 लाख की राशि का राजस्व प्राप्त किया और निर्धारित लक्ष्य प्राप्त कर लिया।

वर्ष के दौरान वनराजा एवं श्रीनिधि पेरेंटों के एक-एक बैच का पालन-पोषण मणिपुर केंद्र में किया गया। मणिपुर में किसानों को कुल 12,420 उन्नत कुक्कुट जर्मप्लाज्म वितरित किया गया। वर्ष 2022-23 के दौरान केंद्र ने रु. 14.61 लाख राजस्व प्राप्त किया।

रिपोर्टिंग अवधि के दौरान वनराजा और ग्रामप्रिय पेरेंटों के एक-एक बैच का पालन-पोषण होसुर केंद्र में किया गया। तमिलनाडु में लाभार्थियों को कुल 54,708 उन्नत ग्रामीण कुक्कुट (वनराजा और ग्रामप्रिया) जर्मप्लाज्म वितरित किए गए। केंद्र ने वर्ष के दौरान कुल रु. 12.50 लाख का राजस्व अर्जित किया।

वर्ष के दौरान गोवा केंद्र में श्रीनिधि और ग्रामप्रिया के पेरेंटों का एक-एक बैच का पालन-पोषण हुआ। गोवा, कर्नाटक और महाराष्ट्र में किसानों को कुल 22,733 उन्नत कुक्कुट जर्मप्लाज्म वितरित किए गए। रूपए 5.30 लाख का राजस्व प्राप्त किया गया।

निकोबारी पेरेंटों के एक बैच को पोर्ट ब्लेयर में गहरी अपशिष्ट प्रणाली के तहत पाला गया । वर्ष के दौरान अंडमान और निकोबार द्वीप समूह में किसानों को कुल 10,023 कुक्कुट जर्मप्लाज्म वितरित किए गए जिससे रु. 2.80 लाख राजस्व प्राप्त किया गया।

वनराजा और श्रीनिधि के पेरेंटों का एक-एक बैच का पालन-पोषण भाकृअनुप आरसी एनईएच क्षेत्र, उमियाम में हुआ । मेघालय में किसानों को कुल 17,744 उन्नत कुक्कुट जर्मप्लाज्म वितरित किए गए, रूपए 8.67 लाख की राशि राजस्व प्राप्त हुआ।

वनराजा पेरेंटों के दो बैचों का पालन-पोषण श्रीनगर केंद्र में किया गया । जम्मू-कश्मीर के किसानों को कुल 21,466 उन्नत कुक्कुट जर्मप्लाज्म वितरित किए गए। रूपए 5.76 लाख राशि राजस्व प्राप्त हुआ।

वनराजा पेरेंटों के तीन बैचों को एसवीवीयू, तिरूपति, आंध्र प्रदेश में बनाए रखा गया । किसानों को कुल 8,396 चूजों की आपूर्ति की गई और इस अवधि के दौरान चूजों और अंडों की बिक्री से रूपए 2.69 लाख का राजस्व प्राप्त हुआ।

रिपोर्टिंग अवधि के दौरान ग्रामप्रिया और असील संकर के दो बैच , और वनश्री , कड़कनाथ और घागस के प्रत्येक बैच को पीवीएनआरटीवीयू, वारंगल, तेलंगाना में पाला गया। किसानों को कुल 50,709 उन्नत ग्रामीण कुक्कुट जर्मप्लाज्म वितरित किए गए। इस अवधि के दौरान केंद्र ने कुल रु. 14.95 लाख का राजस्व अर्जित किया है।

केंद्रों द्वारा वितरित विभिन्न किस्मों को पालने वाले किसानों से प्राप्त प्रतिक्रिया उत्साहजनक रही।

2022-23 के दौरान कुक्कुट बीज परियोजना के अंतर्गत जर्मप्लाज्म का केंद्रवार वितरण

केंद्र	जर्मप्लाज्म (संख्या)	राजस्व (लाख रूपये में)	लाभान्वित किसान (संख्या)
बीएसयू,पटना	55,367	18.81	1750
भाकृअनुप आरसी एनईएच, झरनापानी	61,368	34.09	847
भाकृअनुप आरसी एनईएच , गंगटोक	56,485	14.02	1761
भाकृअनुप आरसी एनईएच , इंफाल	12,420	14.61	122
तनुवास, होसूर	54,708	12.50	1056
भाकृअनुप-सीसीएआरआई, गोवा	22,733	5.30	1002
भाकृअनुप-सीआईएआरआई, पोर्ट ब्लेयर	10,023	2.80	65
एसकेएयूएसटी, श्रीनगर	21,466	5.76	380
भाकृअनुप आरसी, मुख्यालय, उमियाम	17,744	8.67	849
पीवीएनआरटीवीयू, वारंगल	50,709	14.95	800
एसवीवीयू, तिरूपति	8,396	2.69	255
कुल	**3,71,419**	**134. 2**	**8887**

2 Executive Summary

All India Coordinated Research Project on Poultry Breeding

AICRP on Poultry Breeding is one of the successful projects being operated at twelve centres viz. KVASU, Mannuthy; AAU, Anand; KVAFSU, Bengaluru; GADVASU, Ludhiana; OUAT, Bhubaneswar; ICAR-CARI, Izatnagar; ICAR RC for NEH Region, Agartala; NDVSU, Jabalpur; AAU, Guwahati; BAU, Ranchi; MPUAT, Udaipur; and CSKHPKVV, Palampur. The main objectives of the project are development of location specific chicken varieties, conservation, improvement, characterization and application of local native, elite layer and broiler germplasm, development of package of practices for village poultry and entrepreneurships in rural, tribal and backyard areas. In addition, KVASU, Mannuthy and AAU, Anand centres to maintain two elite layer germplasm (IWN and IWP). KVAFSU, Bengaluru, GADVASU, Ludhiana, OUAT, Bhubaneswar and ICAR-CARI, Izatnagar to maintain a total of four (two by each centre) elite broiler germplasm (PB-1, PB-2, CSML and CSFL).

Pedigreed random bred control populations (one for layer and the other for broiler) were maintained at ICAR-Directorate of Poultry Research, Hyderabad. Samples of hatching eggs from these populations are being sent to different centres of AICRP on Poultry Breeding to measure the genetic progress. As per the decision taken by the Council, the strains maintained at different AICRP centres and ICAR-DPR were duplicated at various AICRP centres to be utilized in case of exigencies and as a resource population by the centre for production of three and four way crosses. During the year a total of **6,05,064** chicken germplasm was distributed to the farmers from different centres. An amount of Rs. **211.57** lakhs revenue was generated through distribution and propagation of the improved chicken germplasm. A total of 5375 formers were benefited with the germplasm during the year.

In the year 2022-23, AICRP on Poultry Breeding, KVASU, Mannuthy centre evaluated the S-7 generation of native chicken germplasm up to 28 weeks of age. The egg weight at 28 weeks of age was 40.10 g which is 0.46 g higher than the previous generation. The age at sexual maturity was 17.38 days earlier than the previous generation. The centre has also evaluated S-33 generation of IWN and IWP strains of White Leghorn up to 72 weeks of age. The hen day egg production up to 72 weeks of age was 323.70 in IWN and 318.03 in IWP strain. The centre has generated a revenue of Rs. 16.49 lakhs and has supplied a total of 68,220 number of germplasms during the year. The number of farmers benefitted through the germplasm supply from the centre during the current year was 625.

AAU, Anand centre evaluated the S-3 generation of *Ankleshwar* breed of chicken up to 40 weeks of age. Egg production of *Ankleshwar* chicken (S-3 gen) up to 40 weeks of age was 83.31 eggs, which was higher as compared to S-2 generation (81.5). The S-3 generation of IWN and IWP strains was evaluated up to 40 weeks of age. Egg production up to 40 weeks of age was 121.1 in IWN and 126.6 eggs in IWP strain. The S-10 generation of IWD and IWK strains was evaluated up to 40 weeks of age. Egg production up to 40 weeks of age was higher in IWD (109.8) than IWK strain (102 eggs). Anand Agricultural University (Gujarat) had received Breed Conservation Award – 2022 (Institute Award) for *Ankleshwar* breed of chicken from NBAGR, Karnal. The center has supplied a total of 43,146 germplasm during the reporting period. A total of 824 farmers were benefitted. The center has generated the revenue of Rs. 29,08 lakhs during the reporting year.

Bengaluru centre evaluated native chicken, PB-1 and PB-2 lines and their crosses during the year. The five-week body weight was 1082 and 1017g in PB-1 and PB-2 lines, respectively. The egg production upto 40 weeks of age in PB-1 and PB-2 lines was 37.41 and 29.43 eggs, respectively. The body weight of native chicken (S-6) at 8, 20, 40 and 52 weeks of age in females was 248.8, 1067, 1273 and 1389 g, respectively. The hen housed egg production at 40, 52 and 72 weeks of age were 22.10, 27.05 and 49.67 eggs. The egg weight of native chicken at 40 weeks of age was 42.10 g. The phenotypic and genetic response of 5-week body weight in PB-1 was 7.88 and 20.61g, respectively

and corresponding values in PB-2 was 4.34 and 12.98 g, respectively. A total of 1,68,535 chicken germplasm was distributed to 310 farmers. The centre generated revenue of Rs. 44.37 lakhs during the year.

Ludhiana centre carried out the evaluation of *Punjab Brown*, PB-1 and PB-2 lines and a dual-purpose cross during the year. The five-week body weight was 1190 and 1094 g in PB-1 and PB-2 lines, respectively with corresponding FCR of 1.90 and 1.88, respectively. The egg production up to 40 weeks of age was 65.14 and 70.63 in PB-1 and PB-2 lines, respectively. In *Punjab Brown*, the 8-week body weight was 691.5 g in males and 633.3 g in females with FCR of 3.8. The egg production up to 52 weeks of age was 110.7 eggs in *Punjab Brown*. The egg weight at 36 weeks of age was 55.25 g. Farm evaluation of dual cross (PB-2 x *Punjab Brown*) was undertaken and reached 841.2 g at 8 weeks. Egg production up to 52 weeks of age was 145 eggs in the cross. The centre distributed 87,364 germplasm to the 363 farmers. The centre generated revenue of Rs.29.11 lakhs.

The Bhubaneswar centre assigned to evaluate native *Hansli*, CSML and CSFL lines. A total of 182 good chicks of S-1 generation of *Hansli* chicken were hatched. Body weight at 8 and 20 weeks of age in *Hansli* was 603.26 and 1583 g, respectively. The hen day egg production at 40 and 52 weeks of age were 25.22 and 34.36 eggs in *Hansli* chicken. The average body weight at 5 weeks of age was 1018 and 1123 g in CSFL and CSML, respectively. Egg production up to 40 weeks of age in CSFL and CSML were 64.31 and 61.55 eggs. The centre supplied 7,827 numbers of germplasms to 371 farmers. A revenue of Rs. 1.40 lakhs was generated.

ICAR-CARI centre evaluated the local native chicken (S-7) germplasm and 998 good chicks were produced. A total of 2205, 2257 and 651 good chicks of CSML, CSFL and control lines were produced. The body weight at 5 weeks of age in CSML, CSFL and control lines were 1257, 1242 and 669.8 g, respectively. The hen housed egg production up to 40 weeks in CSML, CSFL and control lines was 67.18, 68.40 and 56.50 eggs, respectively during S-19 generation. A total 16,138 germplasm were supplied to the 23 farmers and other stakeholders.

The Agartala (Tripura) centre evaluated the *Tripura Black*, *Dahlem Red*, CSFL and their crosses during the year. In the E-6 evaluation of the BND cross, the 72 weeks egg production was 159.3 and 138.8 eggs under farm and field conditions, respectively. E-7 evaluation of BND cross was completed up to 52 weeks under farm and up to 40 weeks of age under field conditions. During E-7 evaluation of the BND cross, the 52 weeks egg production was 93.35 under farm and 54.12 eggs up to 40 weeks of age under field conditions. The age of sexual maturity recorded in E7 was slightly more as compared to the previous (E6) evaluation. A total of 13 training programmes were organized on poultry farming for 549 rural farmers. A total of 19,081 poultry germplasms were supplied to 623 farmers with a revenue receipt of Rs. 10.70 lakhs.

The Jabalpur centre evaluated the G-2 population of *Jabalpur colour* and *Kadaknath* from 7 weeks to 72 weeks of age. Body weight of *Jabalpur colour* at 20, 40, 52 and 72 weeks of age was 1536, 2003, 2140 and 2761g, respectively. Whereas, *Kadaknath* birds weighed 1123, 1514, 1690 and 2016 g, at corresponding age. *Jabalpur colour* birds matured at 155 days while *Kadaknath* at 167 days of age. Hen day egg production of *Jabalpur colour* up to 40, 52 and 72 weeks of age was 99.80, 162.0 and 248.6 eggs, respectively while hen day egg production of *Kadaknath* breed at respective age was 64.0, 94.4 and 118.1 eggs. Body weight of *Narmadanidhi* at 8 and 20 weeks of age was 1010 and 1506 g for males and 725 and 1384 g for female birds under farm conditions whereas under field condition body weight of *Narmadanidhi* at 8 and 20 weeks of age was 772 and 1436 g for male and 687 and 1206 g for female birds. Under field rearing egg production of *Narmadanidhi* up to 52 weeks of age was 93.2 eggs with egg weight of 48.5g. A total of 34,978 chicken germplasm was distributed to 440 farmers with revenue receipts of Rs. 14.69 lakhs. A total of 160 ST beneficiaries were trained in 8 trainings under TSP components of the project.

Udaipur centre evaluated the *Mewari*, CSFL, RIR and *Pratapdhan* populations during the year. The body weight at 40 weeks of age was 1680 g in *Mewari* females. The egg production up to 52 weeks of age was 53.13 eggs in *Mewari* breed of chicken. The annual egg production (up to 72 weeks of age) was 162.5 in *Pratapdhan*. Six training programmes were organized during the reporting period, benefitting 300 tribal farmers under TSP component of the project. A total of 41,836 improved chicken germplasm was distributed to about 769 farmers during the current year. The centre realized Rs 12.09 Lakhs from the distribution of germplasm. Four research papers were published during the report period.

The Palampur centre has evaluated the G-10 generation of *native* chicken germplasm, G-9 generation of *Dahlem Red* and *Himsamridhi* during the year. The HDEP and HHEP of native chickens up to 72 weeks of age was 111.7 and 119.6, respectively. The egg weight at 40 and 52 weeks of age was 46.15±0.20 and 49.24±0.15 g, respectively. In *Dahlem Red,* HHEP and HDEP up to 52 weeks of age was 131.6 and 144.2, respectively. The egg weight at 40 and 52 weeks

of age was 52.40±0.26 and 55.33±0.10 g, respectively. For *Dahlem Red* x *Native* birds the HHEP and HDEP up to 52 weeks of age was 102.5 and 108.6, respectively. The HHEP and HDEP up to 52 weeks of age were 113.9 and 119.3, respectively for *Himsamridhi* birds. During the year, the centre supplied 60,149 chicks/growers to 661 farmers in different regions of state including tribal areas. The centre realized receipts of Rs 27.32 lakhs during the current year.

The Guwahati centre evaluated the native, *Dahlem Red*, *Daothigir* and BN populations up to 72 weeks of age. *Kamrupa* was also evaluated up to 72 weeks of age under farm and field conditions. The average fertility of all the flocks was found to be 89.36%. The mortality during brooding and growing period was below 4.64% in all the lines. The 5 weeks body weight was 185.8g in indigenous and 445.6g in *Dahlem Red*. In native population the egg weight and egg production, up to 72 weeks was 42.10g and 112.1 eggs, respectively. In *Dahlem Red*, egg production improved by 0.2 eggs. The five weeks body weight was 390.8g and FCR was 2.90 in BN cross. In *Kamrupa*, the age at first egg in the flock was 148.6 days in the farm and 169.4 days in the field. The hen housed egg production up to 40, 52 and 72 weeks of age was 51.30, 92.90 and 155.70 eggs in the farm and corresponding values in the field were 45.60, 75.80 and 124.60 eggs, respectively. For *Daothigir* the age at sexual maturity was 198.2 days. The hen housed egg production up to 72 weeks of age was 116.7 eggs. The egg weight at 72 weeks was 36.80 g. The centre supplied 26,874 numbers germplasm to 250 farmers. The centre realized receipt of Rs. 6.16 lakhs during the current financial year.

The Ranchi centre evaluated G-10 generation of native population up to 72 weeks of age. *Jharsim* (E-10) was evaluated up to 72 weeks. The fertility in native chicken was 87.60%. The fertility improved marginally. The hatchability on fertile eggs set was 75.76% in native chicken. The hen housed egg production up to 72 weeks was 144.43 eggs in native population during G-10 and it improved marginally as compared to previous generation. In *Jharsim* (E-10) hen housed egg production up to 72 weeks of age was 170.94 eggs under farm conditinos. The body weights at day old and 4, weeks were better in Jharsim during E-11 evaluation. Centre supplied 30,916 germplasm to 116 farmers, KVKs, NGOs, and other agencies. The centre realized the receipt of Rs. 2.47 lakhs during the current financial year.

Poultry Seed Project

Poultry Seed Project (PSP) was evolved with an objective to increase the availability of rural chicken germplasm in remote areas of our country. In this endeavor, the Indian Council of Agricultural Research has initiated "Poultry Seed Project" during the XI five-year plan with six centres, three in the northeast region and three in different state veterinary/ agricultural universities. The project has been strengthened during the XII plan by adding five more centres to cater to needs of the farmers in their respective regions. At present the project is being operated at 12 centres across the country. The main objective of this project is local production of improved chicken germplasm (fertile eggs, day old chicks and grownup chicks) and supply to various stake holders in the remote areas to target production enhancement of egg and meat for augmenting rural poultry production, socio-economic condition of the target groups and linking small scale poultry producers with organized market.

Table 1. Germplasm supply and revenue generation during 2022-23

Centre	Germplasm supply (Nos.)	Revenue generated (Rs. in lakhs)	No. of Farmers
KVASU, Mannuthy	68,220	16.49	625
AAU, Anand	43,146	29.08	824
KVAFSU, Bengaluru	1,68,535	44.37	310
GADVASU, Ludhiana	87,364	29.11	363
OUAT, Bhubaneswar	7,827	1.40	371
ICAR-CARI, Izatnagar	16,138	17.69	23
NDVSU, Jabalpur	34,978	14.69	440
CSKHPKVV, Palampur	60,149	27.32	661
ICAR-RC, Agartala	19,081	10.70	623
AAU, Guwahati	26,874	6.16	250
MPUAT, Udaipur	41,836	12.09	769
BAU, Ranchi	30,916	2.47	116
Total	**6,05,064**	**211.57**	**5375**

The PSP centres are located at Bihar Animal Sciences University, Patna; West Bengal University of Animal and Fishery Sciences, Kolkata; ICAR Research complex for NEH region, Nagaland centre, Jharnapani; ICAR Research complex for NEH Region, Sikkim Centre, Gangtok; ICAR Research complex for NEH region, Manipur centre, Imphal; Tamil Nadu Veterinary and Animal Sciences University,

Hosur, ICAR-Central Coastal Agricultural Research Institute, Panaji; ICAR-Central Island Agricultural Research Institute, Port Blair; Sher-e-Kashmir University of Agricultural Sciences and Technology, Srinagar, PVNR Telangana Veterinary University, Warangal; Sri Venkateshwara Veterinary University, Tirupati and ICAR Research Complex for NEH Region, Umiam.

The Directorate as a coordinating unit, supplies parent chicks, co-ordinates and monitors the activities of different centres to enable them to achieve the set targets for each centre. The target set for supplying chicks for mainland and north-east centres during the year 2022-23 were between 0.5 and 1.0 lakh chicks per annum for different centres and to collect feedback on the performance of the germplasm under backyard farm conditions. A total of 3,71,419 improved chicken varieties have been distributed to 8887 farmers in their respective regions/states with a revenue receipt of Rs. 134.2 lakhs during the year.

One batch of *Vanaraja* parents was reared at Patna Centre. A total of 55,367 commercial chicken germplasm was distributed to the farmers in Bihar during the year 2022-23 with an amount of Rs. 18.81 lakhs revenue.

One batch each of *Vanaraja* and *Srinidhi* were in position at Jharnapani centre. A total of 61,368 improved chicken germplasm was distributed to farmers of Nagaland and neighbouring states during the year 2022-23. A total of Rs. 34.09 lakhs revenue was generated under PSP at Jharnapani Centre.

Two batches of *Vanaraja* parents were reared at Sikkim centre. A total of 56,485 improved chicken germplasm of *Vanaraja* was distributed to farmers in Sikkim with an amount of Rs. 14.02 lakhs revenue. The centre achieved the set target of germplasm.

One batch each of *Vanaraja* and *Srinidhi* parents were reared at Manipur Centre during the year. A total 12,420 improved chicken germplasm was distributed to the farmers in Manipur. The Centre has generated Rs. 14.61 lakhs of revenue during the year 2022-23.

One batch each of *Vanaraja* and *Gramapriya* parents were reared at Hosur Centre during the reporting period. A total of 54,708 improved rural chicken (*Vanaraja* and *Gramapriya*) germplasm was distributed to beneficiaries in Tamil Nadu. The Centre has generated total revenue of Rs. 12.50 lakhs during the year.

One batch each of *Srinidhi* and *Gramapriya* parents were reared at Goa Centre during the year. A total of 22,733 improved chicken germplasm was distributed to farmers in Goa, Karnataka and Maharashtra with a revenue of Rs. 5.30 lakhs.

One batch of *Nicobari* parents was reared under deep litter system at Port Blair. A total of 10,023 chicken germplasm was distributed to farmers in Andaman & Nicobar Islands during the year with a revenue generation of Rs. 2.80 lakhs.

One batch each of *Vanaraja* and *Srinidhi* parents were reared at ICAR RC for NEH Region, Umiam. A total 17,744 improved chicken germplasm was distributed to the farmers in Meghalaya with an amount of Rs. 8.67 lakhs of revenue.

Two batches of *Vanaraja* parents were reared at Srinagar centre. A total of 21,466 improved chicken germplasm was distributed to the farmers of Jammu and Kashmir with an amount of Rs. 5.76 lakhs of revenue.

Three batches of *Vanaraja* parents were maintained at SVVU, Tirupati, Andhra Pradesh. A total of 8,396 chicks were supplied to the farmers and generated Rs.2.69 lakhs as revenue by sale of chicks and eggs during the period.

Two batches of *Gramapriya* and Aseel cross, and one batch each of *Vanashree*, *Kadaknath* and Ghagus were reared at PVNRTVU, Warangal, Telangana during the reporting period. A total of 50,709 improved rural chicken germplasm was distributed to the farmers. The centre has generated total revenue of Rs. 14.95 lakhs during the period.

Feedback received from farmers rearing different varieties that were distributed by different centres was encouraging.

Table 2. Centre wise distribution of germplasm under Poultry Seed Project during 2022-23

Centre	Germplasm supply (Nos.)	Revenue generated (Rs. in lakhs)	No. of Farmers
BASU, Patna	55,367	18.81	1750
ICAR RC NEH, Jharnapani	61,368	34.09	847
ICAR RC NEH, Gangtok	56,485	14.02	1761
ICAR RC NEH, Imphal	12,420	14.61	122
TANUVAS, Hosur	54,708	12.50	1056
ICAR-CCARI, Goa	22,733	5.30	1002
ICAR-CIARI, Port Blair	10,023	2.80	65
SKUAST, Srinagar	21,466	5.76	380
ICAR RC NEH, H.Q., Umiam	17,744	8.67	849
PVNRTVU, Warangal	50,709	14.95	800
SVVU, Tirupati	8,396	2.69	255
Total	**3,71,419**	**134.2**	**8887**

3 Budget

AICRP on Poultry Breeding (2022-23)

(Rs.in Lakhs)

AICRP Centre	Actual budget released (ICAR share)	Budget for (State share)	* Total expenditure	Expenditure on feed	# Receipts
KVASU, Mannuthy	62.40	20.80	83.20	46.48	16.49
AAU, Anand	59.40	19.80	79.20	42.48	29.08
KVAFSU, Bengaluru	68.40	22.80	91.20	32.26	44.37
GADVASU, Ludhiana	63.30	21.10	84.40	25.00	29.11
OUAT, Bhubaneshwar	54.40	18.13	72.53	2.97	1.40
NDVSU, Jabalpur	69.40	23.13	92.53	12.06	14.69
CSKHPKV, Palampur	67.40	22.47	89.87	30.05	27.32
ICAR RC NEH, Agartala	30.00	0.00	30.00	9.35	10.70
AAU, Guwahati	43.60	14.53	58.13	23.70	6.16
MPUAT, Udaipur	84.02	28.01	112.03	13.57	12.09
BAU, Ranchi	52.30	17.43	69.73	9.56	2.47
Total	**654.62**	**208.20**	**862.82**	**247.48**	**193.88**

* Indicated Total expenditure figure is released figure inclusive of ICAR share and State share

Excluding ICAR-CARI centre

Poultry Seed Project (2022-23)

(Rs.in Lakhs)

Centre	Budget released (2022-23)	*Total expenditure	Receipts
BASU, Patna	22.00	22.00	18.81
ICAR-RC NEH, Jharnapani	61.00	61.00	34.09
ICAR-RC NEH, Gangtok	62.00	62.00	14.02
ICAR-RC NEH, Imphal	49.00	49.00	14.61
ICAR-RC NEH, Umiam	53.00	53.00	8.67
TANUVAS, Hosur	26.00	26.00	12.50
ICAR-CCARI, Goa	10.00	10.00	5.30
ICAR-CIARI, Port Blair	15.00	15.00	2.80
SKUAST, Srinagar	17.00	17.00	5.76
PVNRTVU, Warangal	23.00	23.00	14.95
SVVU, Tirupati	22.00	22.00	2.69
Total	**360.00**	**360.00**	**134.2**

*Indicated Total expenditure figure is released figure

4 AICRP on Poultry Breeding

History

The Directorate of Poultry Research had a modest beginning during the IV five-year plan with two coordinated projects entitled "All India Coordinated Research Project on Poultry for Egg" and "All India Coordinated Research Project on Poultry for Meat" to evolve suitable strains of egg and meat type chicken that combine well for production of commercial layer and broiler crosses. Both these projects were merged into a single project namely "All India Coordinated Research Project on Poultry Breeding" during the V plan. The 'Rural Poultry' component of the project was initiated with one centre at Agartala in 2001. Subsequently it was expanded to six centres during XI plan with the sole objective of development of location specific rural poultry varieties. This was elevated to the status of a Project Directorate during the VII plan period. Besides AICRP on Poultry Breeding, Project Directorate also encompassed two more coordinated projects i.e. AICRP on Poultry Nutrition and AICRP on Poultry Housing and Management, which were subsequently phased out during 1992-93.

The head quarter of the Project Directorate on Poultry was established at Andhra Pradesh Agricultural University Campus, Rajendranagar, Hyderabad with effect from 1st March, 1988. Coordination and monitoring had been assigned to the Directorate (Coordination Cell) to start with. Subsequently, Nucleus Stock Production Unit as a centre of AICRP on Poultry Breeding was established at the Project Directorate for multiplication and supply of the parents and their commercial crosses released from the project centres. The Directorate had been entrusted with additional responsibilities of maintenance, evaluation, production and supply of control populations of egg and meat to the centres from 1st April, 1990. Maintenance of layer and broiler control populations previously maintained at HAU, Hissar and UAS, Bangalore respectively was assigned to this Directorate w.e.f. 1.4.1990. The Directorate had been entrusted with the evaluation of commercial layers and broilers developed at different centres of the project vis-a-vis those available in the market from other hatchery sources and maintenance of the elite stocks of layers and broilers available in the country/to be imported from abroad in future and to undertake their genetic description and characterisation with respect to bio-chemical, immunological

Location of the centres of AICRP on poultry breeding

Sl. No	Name of the Centre	Period
1	Anand Agricultural University, Anand	06-07-1977 to 31-03-2023
2	Kerala Veterinary and Animal Science University, Mannuthy	19-02-1977 to 31-03-2023
3	Karnataka Veterinary, Animal and Fishery Sciences University, Bengaluru	14-01-1970 to 31-03-2023
4	ICAR-Central Avian Research Institute, Izatnagar	01-04-1970 to 31-03-2023
5	Guru Angad Dev Veterinary and Animal Science University, Ludhiana	26-02-1977 to 31-03-2023
6	Orissa University of Agriculture and Technology, Bhubaneswar	21-01-1971 to 1990 and 01-09-1991 to 31-03-2023
7	ICAR Research Complex for NEH region, Agartala	01-08-2001 to 31-03-2023
8	Nanaji Deshmukh Veterinary Science University, Jabalpur	11-06-1970 to 31-03-2023
9	Assam Agricultural University, Guwahati	23-03-2009 to 31-03-2023
10	Birsa Agricultural University, Ranchi	23-03-2009 to 31-03-2023
11	Maharana Pratap University of Agriculture & Technology, Udaipur	23-03-2009 to 31-03-2023
12	CSK Himachal Pradesh Krishi Viswavidyalaya, Palampur	23-03-2009 to 31-03-2023
13*	ICAR-Directorate of Poultry Research, Hyderabad	

*Control Population Unit

cytogenic and disease resistance traits. Research was also envisaged in the areas of poultry nutrition, poultry housing and management, and poultry health. Identification of alternative feed resources and their chemical and biological evaluation and development of least cost poultry ration was the priority of poultry nutrition research. In the discipline of poultry housing and management, biological efficiency of different management practices for economic poultry raising was intended to be determined. Surveillance and monitoring of poultry diseases and development of kits for quick diagnosis of diseases was proposed to be the main objective of poultry health research. Currently the Directorate is operating its research programmes within the frame work of the approved Perspective Plan. During the year 2014-15 the Project Directorate on Poultry has been upgraded to Directorate of Poultry Research.

Objectives

During the year 2014-15, AICRP on Poultry Breeding was reoriented towards Rural Poultry. The objectives of AICRP on Poultry Breeding are as follows.

- To develop location specific chicken varieties and their dissemination for village poultry.
- Conservation, improvement, characterization and application of local native and elite layer and broiler germplasm.
- To develop package of practices for village poultry and entrepreneurships in rural, tribal and backyard areas etc.

Monitoring role of the coordinating unit/ Directorate

- Organization of Review Committee meeting/ scientists meet/workshops
- Compilation of periodical reports received from individual centres for submission to ICAR and preparation of Annual Report
- Verification and scrutiny of proposals received from different centres in all aspects relating to budget, release of funds and in all other matters relating to the functioning of various centres and their onward transmission to ICAR
- Preparation of EFC proposals.
- Preparation of DARE's Report and Research Highlights
- Compilation of report for answering the parliament questions
- Visit to different centres of the project for review of progress

5 Technical Programme

Technical Programme in brief for the year 2022-2023

- Pedigreed hatching and evaluation of the local native chicken.
- Procurement and evaluation of improved chicken germplasm in the local climatic condition and for development of cross.
- Production and evaluation of crosses of local native birds with improved germplasm.
- Development and evaluation of terminal crosses (location specific germplasm)

Native chicken

Genetic improvement of Native chicken for body weight as well as egg production may be practiced for bringing faster genetic gain in the terminal crosses.

Selection criteria: Mass Selection for higher 16-week body weight and independent culling level for 40-week egg production

- Regeneration in pedigreed mating with 50 sires and 250 dams
- Production of about 1500 chicks
- Selection for body weight at 16 weeks: Mass Selection
- About 400-500 females and 200-250 males will be housed
- Selection for egg production at 40 weeks: Independent Culling Level
- About 250 dams and 50 sires will be selected as parents for next generation.

If there is demand for new type of variety (cross) the centre should conduct survey and establish the need for second variety before starting the work. The centres are strictly instructed to start the work only after the approval of the competent authority.

Traits to be recorded

- Body Weight at 20 and 40 wks
- ASM
- Egg weight at 28 and 40 wks
- Egg production to 72 wks
- Mortality - 0-6, 7-20, 21-40 and 41-72 wks
- Field Evaluation of about 250 birds under backyard/ free range

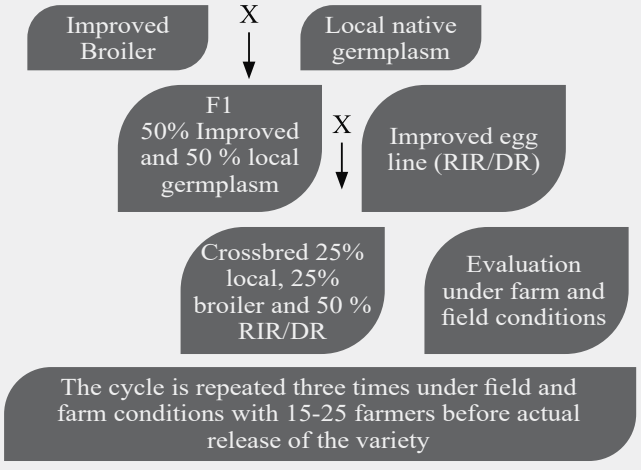
Development of crosses

The centre needs to conduct a survey in the region for the consumer preference and acceptability for the type of variety. Based on the survey, a decision is to be taken about the type of chicken variety either dual or egg type, to be developed by the centre

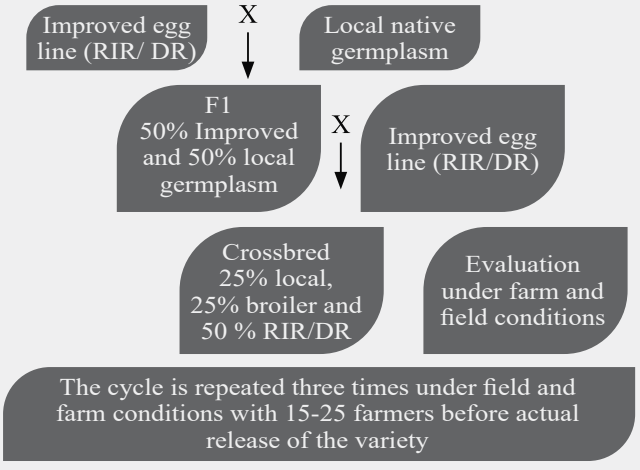
Flocks to be selected for Rural Poultry

- Local native chicken (with better phenotypic performance) in the respective agro-climatic zones

Technical program: Dual Type chicken



Technical program for Egg type chicken



Improved egg type or meat type chicken developed by ICAR/ SAUs to be procured.

Conservation of elite germplasm

A. Technical programme for layers

1. Layer centres will work on maintenance of elite layer populations.
2. Collection, characterization and conservation of local-native germ plasm.
3. Production and evaluation of crosses under farm and field conditions.
4. Development of location specific varieties.
5. Impact assessment
6. The strains that are being maintained at present will be continued. IWH, IWI, IWD, IWF and IWK will be maintained at ICAR-DPR, Hyderabad. IWN and IWP, strains will be maintained since they have been identified as most promising, lines.
7. To maintain the pure line performance, the selection programme currently under progress in the AICRP will be continued with lesser intensity of selection. The entire flock of each population will be maintained till 64 weeks of age. The following traits will be measured:

- Age at first egg
- Body weight at 16, 40 and 64 weeks of age.
- Egg weight at 28, 40 and 64 weeks of age.
- For those populations having low egg weight, the first ten eggs also need to be measured.
- Egg production to 40 and 64 weeks of age and computation of egg production on hen housed and hen day basis.
- A random sample of 100 eggs will be utilized at 40 weeks of age to measure albumen height and index, yolk height and index and shell thickness and Haugh unit score. The percentage of blood and meat spots will also be recorded.
- Percent fertility and percent hatchability on total and fertile eggs set will be measured. The minimum expectation will be more than 90% fertility and 80% hatchability on fertile eggs set.
- Mortality during the following periods: 0-8, 9-16, 17-40, 41-64 and 17-64 weeks of age.
- The minimum expectation will be less than 6% mortality during 0-8 weeks. Less than 5% mortality during 9-16 weeks. Less than 1% mortality per month during the period 17-64 weeks in the layer house.
- Among the selected breeders, three eggs from each female will be broken for measuring the shell thickness. Breeders with very thin shell eggs will be replaced by breeders with better egg shell thickness before the mating are arranged.

8. All centres will maintain all the surviving birds of first hatch to record egg production till 72 weeks of age.
9. Only 350 females and 50 males will be selected from each population to reproduce next generation (only by artificial insemination). It is expected that in four hatches of 10 days interval, a total of 1400 female chicks and 500 male chicks will be retained for each population.
10. A total of at least 600 pullets for each population will be housed at 16 weeks of age in individual laying cages for generating the data. The desired number of males will have to be housed for each population.
11. Only 300 males will be retained at 16 weeks of age at the rate of six males per sire family. They may be housed either in cages or on deep litter in floor pens depending on the available facilities (all care should be taken to prevent mortality in the males, saved at 16 weeks, as it will affect the selection differential from the male side and also the average selection differential).
12. The hen housed egg production up to 64 weeks of age will be the criterion of selection.
13. The selection will be practiced in both the sexes for 64 weeks hen housed egg production and 28 weeks egg weight. Selection for egg production will be carried out on the basis of an index that takes into account individual production and its sire and dam family averages (Osborne, 1957 a and b). The selection for egg weight, obtained at 28 weeks, will be utilized as independent culling level selection to be superimposed over the selection for 64 weeks egg number. For giving due weightage to viability, in selection programme only hen housed family average need to be used in computation of Osborne index values.
14. Based on the index values, only 450 pullets will be selected on the basis of egg production. Out of these

450 pullets, based on the low early egg weight and shell thickness, 100 pullets will be rejected. Thus, finally only 350 pullets and 50 males will be selected which are good for egg production having better egg weight and with good shell thickness.

15. The chicks will be sexed at hatching, in all layer-populations and 1400 females 500 males at the rate of 10 males per sire family will be saved. All male chicks will be dubbed.
16. All centres will keep a sample of layer control females hatched from the hatching eggs received from ICARDirectorate of Poultry Research (at least 200 females will have to be housed at 16 weeks of age). They will also be evaluated along with the selected populations.
17. Uniform reporting of the data by all the centres.
18. Maximum publicity through media for popularizing high yielding strains/varieties developed by AICRP on Poultry Breeding.
19. Each centre will record rate of lay and persistency of peak production.
20. The layer control will be supplied by ICAR-DPR to all the centres.

Programme for Layer Control population

The technical programme currently under progress for control populations for egg will be continued. Each population will be reproduced using 50 sires, each sire mating to 4 dams and 4 progeny per dam are to be studied for various growth, production and reproduction traits. In order to obtain 4 progenies for each dam at the time of housing the suitable numbers of chicks are to be hatched. The following traits are to be measured in case of layer control population.

1. Body weight at 16, 40 and 64 weeks of age
2. Age at first egg
3. Egg weight at 28 and 40 weeks of age
4. Egg production to 40 weeks of age and 64 weeks of age
5. Per cent fertility and hatchability on total and fertile eggs set
6. Egg quality traits like albumin index, yolk index, shell thickness and percentage blood and meat spot on a sample of 100 eggs at 40 weeks of age.
7. Mortality during the following period 0-8, 9-16, 17 to 40, 40-64 and 17-64 weeks.
8. About 500 eggs are to be supplied to each egg centre from the Project Directorate for evaluation of environmental trends.

B. Technical programme for Broilers

Development of sire and dam line population

1. Broiler centres will work on maintenance of elite broiler populations.
2. Collection, characterization and conservation of local native germ plasm.
3. Production and evaluation of crosses under farm and field conditions.
4. Development of location specific varieties and impact assessment
5. The centres will continue to develop the existing female line available with them.
6. Centres involved in development of dam line population will produce 3,500 chicks in each generation.
7. It is expected that at least 3000 chicks will contribute to data at 5 weeks for making necessary selection.
8. Between 5th and 6th week, a total of 1200 females will be selected based on five weeks body weight.
9. A total of 250 best males will also be selected on body weight at 5 weeks.
10. At the age of 12 weeks a physical selection will be taken up and 1000 females without any physical defects will be retained and 200 males will also be retained after screening them for satisfactory physical appearance.
11. About 500 females will be housed in individual cages.
12. Simultaneously, 150 best males out of the 200 males will also be housed in cages or on deep litter.
13. The females will be evaluated for dam line traits till the time the youngest hatch attains 40 weeks of age and sire family selection will be practiced.
14. Out of the surviving females, a total of 350 females will be selected and will be mated to 70 best males selected from the available 200 males housed at 18 weeks of age to obtain replacement progeny (The artificial insemination is mandatory to reproduce the next generation so as to ensure high percentage fertility and good number of chicks).
15. It is estimated that in 4 to 5 hatches of 7 to 10 days

interval, the required number of chicks can be reproduced from the 350 selected female breeders mated to 70 selected male breeders.

16. The criterion of selection, for the females, will be the sire means for settable egg production. Similarly, the males from the sire families from which females have been chosen will be selected as male parents.

17. The shape index of the eggs needs to be measured at 32 weeks of age by measuring the length and width of egg. It is desirable to measure the shape index for five consecutive days. The acceptable shape index is suggested as 1.30 to 1.50.

Restriction programme: Since the birds are selected at 5 weeks of age, a graph has to be generated assuming a target body weight of 2150 to 2200g at 20 weeks of age in dam line and 2400g at 20 weeks in sire line. Assuming linearity, a graph has to be developed starting from the mean weight of the selected birds at 5 weeks of age and the expected body weight at bi-weekly interval need to be identified as applicable to populations at each centre. The trend of the body weight at different ages during the restriction program needs to be plotted along with the expected line. The feed needs to be increased or retained the same according to the adjustment needed for matching with the proposed graph. The allowance arrived, as per the graph, at different ages can be increased by 10 percent in case of males for achieving similar trend of body weight during the restriction period.

Feed formulation: To keep the nutrient content uniform at all the centres, the following recommendations are given.

ICAR-DPR, Hyderabad

1. This centre will maintain the pure lines that are being withdrawn from different centres as nucleus stock.
2. Regeneration and supply of control population to different centres for evaluation of selected lines.

Programme for Broiler Control population

The technical programme currently under progress for control populations for meat will be continued. Each population will be re-produced using 50 sires, each sire mating to 4 dams and 4 progeny per dam are to be studied for various growth, production and reproduction traits. In order to obtain 4 progenies for each dam at the time of housing the suitable number of chicks is to be hatched.

In case of broiler control population, the following traits are to be measured:

1. Body weight at day old 5, 20 and 40 weeks of age
2. Feed consumption to 5 weeks of age
3. Age at first egg
4. Egg production to 40 weeks of age
5. Egg weight at 40 weeks of age
6. Per cent fertility and hatchability on total and fertile eggs set
7. Mortality during the following periods 0-5 weeks, 6-20 weeks, 21-40 weeks
8. Restricted feeding programme is to be practiced from 6 to 20th week.
9. About 300 to 400 hatching eggs of Control line are to be supplied to each of the broiler centres of the ICAR-Directorate of Poultry Research during their hatching season, for evaluation of environmental trends.

Nutrient	Chicks 0-5 weeks	Growers 6-18 weeks	Prebreeders 19-23 weeks	Breeders 24-54 weeks
Energy K.cal/kg	2800-2850	2750-2800	2750-2800	2800
Protein (%)	20	16	16	17
Lysine (%)	1.00	0.80	0.80	0.75
Methionine (%)	0.52	0.41	0.41	0.35
Calcium (%)	1.0	1.0	2.00	3.5
Phosphorus (%)	0.45-0.50	0.45	0.45	0.45
Choline Chloride 50% (%)	0.1	0.1	0.1	0.1
Sodium Chloride	0.4	0.4	0.4	0.4

6 Performance appraisal of AICRP centres

Kerala Veterinary and Animal Sciences University, Mannuthy (Kerala)

Activities assigned

- Conservation characterization and improvement of the native chicken germplasm collected from the field.
- The egg production up to 64 weeks will continue to be the selection criterion in IWN and IWP strains.
- The centre will maintain all the surviving birds of first hatch to record egg production till 72 weeks of age.
- Participation in RSPP tests being conducted by Govt. of India each year with IWN x IWP cross
- Development and evaluation of three-way/four-way crosses.

Action taken

- The S-7 generation of native chicken was evaluated up to 28 weeks.
- The S-33 generation of IWN and IWP strain of White Leghorn was tested up to 72 weeks of age.
- The 3-way cross of ND male (IWN x Desi) with RIR female (NDR) was produced and evaluated in the field conditions
- Hen-housed egg production up to 72 weeks of age was 295.82 and 286.32 in IWN and IWP strain, respectively. The hen-day egg production up to 72 weeks of age was 323.70 and 318.03, respectively and the survivors' egg production was 328.78 and 324.08, respectively in IWN and IWP strain of White Leghorn belonging to S-33 generation.
- The IWN X IWP birds, native chicks and their crosses were supplied to farmers and institutions.

Achievements

A. Development of location specific rural germplasm (egg type)

Production traits of native chickens

The S-7 generation of native chicken was evaluated up to 28 weeks of age and its performance is presented in Table 1.

Table 1. Growth and production performances in S-7 generation of native chicken

Traits	N	Mean ±SE
Body weight (g)		
0 day	1275	31.69±0.35
4 wks	1089	239.0±4.22
8 wks	877	462.7±3.07
12 wks	816	769.8±5.24
20 wks	541	1168±6.90
ASM (d)	517	141.7±0.35
Egg weight (g)		
28 wks	422	40.10±0.84

Fertility and hatchability

The S-7 generation of native chicken was produced by pedigree mating and its performance was evaluated up to 28 weeks of age. The number of sires and dams used for breeding to produce the S-7 generation was 50 and 250 (1:5). As the age of reproduction of next generation (S-7) was 72 weeks, the fertility and hatchability were less compared to the previous generation (Table 2).

Table 2. Summary of incubation records for last three generations of native chicken

Gens.	No. of hatches	Eggs set (Nos.)	Fertility (%)	Good chicks (Nos.)	Hatchability (%)	
					TES	FES
S-5	2	3473	91.50	2714	80.13	89.60
S-6	3	3058	89.33	2485	82.80	92.75
S-7	**3**	**3722**	**81.95**	**2359**	**63.38**	**77.34**

Table 3. Summary of growth and production performances of native chicken for last three generations

Traits	Females			Males		
	S-7	S-6	S-5	S-7	S-6	S-5
Body weight (g)						
0 day	30.93	31.53	28.68	31.63	32.17	28.5
4 wks	223.2	254.3	236	252.6	264.6	245.6
8 wks	455.7	549.3	437.3	485.5	638.3	553.4
12 wks	770.2	736.3	886.9	883.8	1079	1164
ASM (d)	141.72	159.1	155.9	-	-	-
Egg weight (g)						
28 wks	40.10	39.64	38.25	-	-	-
40 wks		43.95	43.04	-	-	-
EP40 wks (Nos.)						
Hen Housed	-	75.75	78.95	-	-	-
Hen day	-	76.61	82.3	-	-	-
Survivors'	-	78.73	83.1	-	-	-

Table 4. Mortality records of native birds for last three generations

Gens.	0-8 wks			9-16 wks			17-40 wks		
	No. Housed	No. Died	Mortality (%)	No. Housed	No. Died	Mortality (%)	No. Housed	No. Died	Mortality (%)
S-5	1215	30	2.47	1185	54	4.56	611	31	5.07
S-6	1565	37	2.36	1523	55	3.60	625	39	6.24
S-7	**1456**	**94**	**6.46**	**1355**	**141**	**10.41**			

Growth traits

Results of body weight recorded at various intervals of both male and female birds, ASM and egg weight recorded at 28 weeks of age are presented in Table 3. In S-7 generation, 28 weeks' egg weight has increased and age at sexual maturity has decreased when compared to the previous generation.

Mortality

The mortality during 0-8 and 9-16 weeks in S-7 generation of native birds was above permissible level.

Performance evaluation of three way cross (NDR)

During the current year, the 3-way cross of ND male (IWN x Desi) with RIR female (NDR) was produced and evaluated in the field conditions at Nadathara and Madakkathara panachayaths of Thrissur district. About 35 backyard farmers were provided with five numbers of 16 weeks old pullets per farmer and the data up to 40 weeks of age were analysed and the results are given in Table 5.

Table 5. The performance of three way cross at field condition

Traits	N	Female	N	Male
Body weight (g)				
0 day	190	35.12±0.16	190	35.60±0.18
4 wks	185	280.3±1.36	186	309.4±2.46
8 wks	179	537.1±5.84	182	691.5±4.25
12wks	177	1007±5.17	179	1279±6.70
16 wks	175	1201±4.82	176	1654±7.49
28 wks	166	1532±7.22	169	2225±7.96
40 wks	145	1756±4.7	151	2403±1.93
ASM (d)	170	157.9±1.64	-	-
Egg weight (g)				
28 wks	170	47.31±1.53		
40 wks	195	49.72±1.90		
EP 40 wks (Nos)				
Hen housed	170	83.26±2.02		
Hen day	-	94.56		
Survivors'	195	87.31±1.97		

B. Improvement of IWN and IWP strains of White Leghorn

The centre evaluated the S-33 generation of IWN and IWP strains of White Leghorn from 17 to 72 weeks of age.

Selection records: The summary of selection records for last four generations is presented in Table 6.

Mortality

The mortality of IWN was 3.53 and 8.72 % during 17-40 and 17-64 weeks, respectively and same was 5.83 and 13.64 % in IWP strain of S-33 generation (Table 7). The mortality in IWP strain and control population during 17-64 weeks of age was slightly higher than the permissible level of 1 % per month.

Production performance

Least square means for different economic traits up to 64 weeks of age in both selected strains (IWN and IWP) and in control population of S-33 generation is presented in Table 8. The hen day egg production up to 64 weeks of age increased by 10.8 and 15.4 eggs in IWN and IWP strains, respectively. The survivors' egg production up to 64 weeks of age also increased by 15.0 and 19.8 eggs in IWN and IWP strains, respectively when compared to previous generation.

Table 6. Summary of selection records of IWN and IWP strains for last three generations

Strains	Gens.	Sires	Dams	Ne (Contributed)	SD in females	SI (σ)
IWN	S-30	50	298	171.3	10.55	0.27
	S-31	50	280	169.7	8.46	0.42
	S-32	**49**	**219**	**160.2**	**12.14**	**0.48**
IWP	S-30	50	297	171.2	10.26	0.29
	S-31	50	282	169.9	11.58	0.58
	S-32	**50**	**199**	**159.8**	**16.88**	**0.61**

Table 7. Mortality percentage at different ages in last three generations

Gens.	Strains	0-8 wks	9-16 wks	17-40 wks	17-64 wks
S-31	IWN	6.57	4.05	3.43	4.27
	IWP	6.04	3.35	5.87	7.87
	Control	2.65	0	3.75	8.75
S-32	IWN	3.97	0.97	2.29	5.45
	IWP	5.82	1.41	3.67	12.67
	Control	4.59	0.00	5.48	4.35
S-33	**IWN**	**3.89**	**1.51**	**3.53**	**8.72**
	IWP	**6.87**	**1.53**	**5.83**	**13.64**
	Control	**4.00**	**0.64**	**5.65**	**12.09**

Production performance

Least square means for different economic traits up to 64 weeks of age in both selected strains (IWN and IWP) and in control population of S-33 generation is presented in Table 8. The hen day egg production up to 64 weeks of age increased by 10.8 and 15.4 eggs in IWN and IWP strains, respectively. The survivors' egg production up to 64 weeks of age also increased by 15.0 and 19.8 eggs in IWN and IWP strains, respectively when compared to previous generation.

Egg number

The birds in S-33 generation have completed the performance evaluation up to 72 weeks of age during the reporting period (Table 9). The hen day egg production up to 72 weeks of age was 323.70 and 318.03 eggs, respectively in IWN and IWP strains of White Leghorn and the survivors' production was 328.78 and 324.08 eggs, respectively.

Table 8. Egg production up to 64 weeks over last three generations in different strains

Gens	IWN			IWP			Control		
	HH64	**HD64**	**Sur64**	**HH64**	**HD64**	**Sur64**	**HH64**	**HD64**	**Sur64**
S-31	263.1	267.7	268.7	247.7	252.2	259.2	174.5	180.7	184.5
S-32	262.4	267.8	268.0	249.6	256.8	257.1	172.2	179.6	180.7
S-33	**256.8**	**278.6**	**283.0**	**249.0**	**272.2**	**276.9**	**199.7**	**212.4**	**214.6**

Table 9. Growth and production performances of IWN and IWP strains (S-33 gen.) and control layer population

Traits	IWN		IWP		Control	
	N	Mean ± SE	N	Mean ± SE	N	Mean ± SE
Body weight (g)						
16 wks	845	1180±4.13	856	1113±3.50	124	1023±10.72
40 wks	770	1524±5.62	767	1489±5.11	117	1399±11.66
64 wks	724	1643±7.01	700	1634±6.73	109	1471±13.29
ASM (d)	843	129.4±0.33	855	132.5±0.33	124	142.8±0.67
EP 40 wks (Nos.)						
Hen housed	845	127.5±1.13	856	124.6±1.02	124	97.6±2.08
Survivors'	773	134.7±0.77	770	130.3±0.83	117	100.7±1.63
Hen day	-	132.6		128.4		100.3

Traits	IWN		IWP		Control	
	N	Mean ± SE	N	Mean ± SE	N	Mean ± SE
EP 64 wks (Nos.)						
Hen housed	845	256.8±2.69	856	249.0±2.63	124	199.7±4.66
Survivors'	728	283.0±1.38	704	276.9±1.50	109	214.6±2.54
Hen day	-	278.5	-	272.2		212.4
Egg weight (g)						
28 wks	775	48.01±0.12	792	48.73±0.11	111	48.80 ± 0.29
40 wks	756	51.48±0.13	744	52.02±0.14	99	50.11±0.50
64 wks	695	54.01±0.15	682	55.12±0.17	104	55.52±0.41
EP 72 wks (Nos.)						
Hen housed	845	295.8±3.26	856	286.3±3.21	-	-
Survivors'	724	328.8±1.64	684	324.1±1.65	-	-
Hen day	-	323.7	-	318.0	-	-

Body weights

The body weight recorded at 64 weeks of age was 85g (1643 g) higher in IWN and 163g (1634 g) higher in IWP strain as compared to the previous generation (Table 10).

Frequency distribution

The frequency of egg production up to 64 weeks of age in IWN and IWP strains of S-33 generation was maximum in the class interval of 281-300, while same was maximum in the class interval of 221-240 in control population (Table 11). The trend was similar to that of earlier generation.

Table 10. ASM and body weights at 64 weeks in last three generations in different strains

Gens.	IWN		IWP		Control	
	ASM (d)	BW64 (g)	ASM (d)	BW64 (g)	ASM (d)	BW64 (d)
S-31	144.3	1501	139.5	1497	147.4	1495
S-32	141.9	1558	140.8	1471	147.8	1306
S-33	**129.5**	**1643**	**132.0**	**1634**	**142.8**	**1472**

Table 11. Frequency distribution of egg production up to 64 weeks of age (S-33 gen.)

Class interval	IWN	IWP	Control
<100	0.089	0.089	0.073
101 - 120	0.017	0.026	0.016
121 - 140	0.014	0.026	0.008
141 - 160	0.015	0.019	0.024
161 - 180	0.011	0.012	0.065
181 - 200	0.015	0.008	0.177
201 - 220	0.013	0.019	0.242
221 - 240	0.008	0.025	**0.250**
241 - 260	0.041	0.074	0.129
261 - 280	0.169	0.185	0.016
281 - 300	**0.378**	**0.379**	
>300	0.230	0.141	

Egg weight

The egg weight at 64 weeks of age increased by 2.18 and 4.06 g in IWN and IWP strains of S-33 generation compared to last generation. (Table 12).

Table 12. Mean egg weights at various ages in last five generations in different strains

Strains	Gens.	Egg weight (g)		
		28 wks	40 wks	64 wks
IWN	S-31	50.29±0.11	50.99±0.11	51.89±0.13
	S-32	49.47±0.10	51.61±0.11	51.83±0.17
	S-33	**48.01±0.12**	**51.48±0.13**	**54.01±0.15**
IWP	S-31	50.05±0.12	50.44±0.13	53.73±0.16
	S-32	48.91±0.1	51.61±0.11	51.06±0.21
	S-33	**48.73±0.11**	**52.02±0.14**	**55.12±0.17**
Control	S-31	46.64±0.28	50.78±0.31	55.59±0.45
	S-32	46.28±0.40	50.79±0.53	51.32±0.64
	S-33	**46.20±0.30**	**50.11±0.50**	**55.52±0.41**

Egg quality

The egg quality traits measured at 40 weeks of age in both IWN and IWP strains of White Leghorn of S-33 generation are presented in Table 13. The egg weight, shape index, albumen height, yolk height, yolk index, yolk colour and Haugh unit score were better in IWN strain compared to IWP strain. The yolk height, yolk index and yolk colour were significantly ($p<0.05$) higher in IWN strain compared to IWP, whereas the shell thickness was significantly ($p<0.05$) higher in IWP strain compared to IWN strain.

Table 13. Mean and SE for egg quality traits at 40 weeks of age (S-33 gen.)

Traits	IWN	IWP	**P value**
No. of eggs	100	100	
Eggs weight (g)	53.39±0.44	53.08±0.41	0.607
Shape index	76.96±0.36	76.14±0.37	0.111
Albumen height (mm)	6.26±0.14	5.96±0.11	0.087
Albumen index	0.08±0.002	0.08±0.002	0.336
Yolk height (mm)	17.13±0.10[a]	16.53±0.09[b]	0.0001
Yolk index	0.43±0.003[a]	0.41±0.003[b]	0.0001
Yolk colour	5.79±0.07[a]	5.47±0.10[b]	0.010
Shell thickness (mm)	0.36±0.003[b]	0.37±0.004[a]	0.017
Haugh unit	79.80±0.98	78.07±0.82	0.177
Blood spot (%)	1	1	-
Meat spot (%)	-	-	-

Means within a row were compared at 5% significance

Heritability estimates

In IWN strain, heritability estimate (S+D) of ASM, BW40, BW64 and EW40 were high in magnitude (Table 14) and the same was moderate in magnitude for BW16, EW28, EW64 and EP64. However, the heritability estimate (S+D) of EP40 was low in magnitude.

In IWP strain, the heritability estimate (S+D) of BW40, BW64 and EW64 were high in magnitude and the same was moderate in magnitude for BW16 and EW28. However, heritability estimate (S+D) of ASM, EW40, EP40 and EP64 were low in magnitude. For most of the traits, the heritability estimate of dam family was higher than that of sire family.

Table 14. Heritability estimates of different traits in IWN and IWP strains (S-33 gen.)

Strains	Traits	Sire	Dam	Sire+Dam
IWN	ASM	0.37±0.14	0.46±0.16	0.41±0.08
	BW16	0.19±0.11	0.50±0.16	0.34±0.08
	BW40	0.43±0.15	0.75±0.17	0.59±0.09
	BW64	0.33±0.13	0.56±0.16	0.45±0.09
	EW28	0.32±0.13	0.32±0.16	0.32±0.08
	EW40	0.12±0.09	0.82±0.17	0.47±0.09
	EW64	0.13±0.10	0.54±0.17	0.33±0.08
	EP40	0.09±0.09	0.08±0.15	0.08±0.06
	EP64	0.00±0.00	0.52±0.16	0.26±0.08
IWP	ASM	0.06±0.08	0.13±0.15	0.09±0.06
	BW16	0.25±0.11	0.39±0.14	0.32±0.07
	BW40	0.22±0.10	0.78±0.15	0.50±0.08
	BW64	0.29±0.12	0.83±0.16	0.56±0.09
	EW28	0.14±0.14	0.27±0.12	0.21±0.07
	EW40	0.16±0.10	0.11±0.13	0.13±0.06
	EW64	0.62±0.18	0.29±0.16	0.45±0.09
	EP40	0.04±0.08	0.01±0.15	0.02±0.06
	EP64	0.00±0.00	0.36±0.16	0.18±0.07

Phenotypic and genetic response

The phenotypic response (-12.55 and -8.80) and genetic response (-8.77 and -3.81) for age at sexual maturity was better in both IWN and IWP strains (Table 15). The phenotypic response for body weight at 16, 40 and 64 weeks of age were positive in both IWN and IWP strains. Meanwhile, the genetic response for body weight was positive at 16 weeks of age and negative thereafter in both IWN and IWP strains.

The genetic response for correlated trait, egg weight at 40 weeks was positive while the same for 28 and 64 weeks were negative. The phenotypic response for hen day and survivors' production was positive in both IWN and IWP strains while the same of hen housed egg production was negative at 40 and 64 weeks of age. The genetic response of all the three egg production traits were negative in both IWN and IWP strains at 40 and 64 weeks of age, except the survivors' production at 40 weeks of age.

Table 15. Phenotypic and genetic response (gain) in primary and various correlated traits in S-33 generation

Traits	Phenotypic		Genetic	
	IWN	IWP	IWN	IWP
ASM (d)	-12.55	-8.80	-8.77	-3.81
Body weight (g)				
16 wks	219.2	186.2	112.9	79.93
40 wks	19.65	52.75	-63.81	-30.06
64 wks	84.65	162.59	-80.97	-2.92
Egg weight (g)				
28 wks	-1.46	-0.18	-3.98	-0.1
40 wks	-0.13	0.41	0.55	1.09
64 wks	2.18	3.36	-2.02	-0.84
EP 40 wks (Nos.)				
Hen Housed	-0.40	-0.95	-5.52	-5.79
Hen Day	4.02	2.44	-3.72	-5.08
Survivors'	5.90	4.01	1.35	-0.57
EP 64 wks (Nos.)				
Hen Housed	-5.63	-0.57	-33.84	-28.16
Hen Day	10.75	15.36	-21.78	-17.44
Survivors'	15.01	19.80	-18.69	-14.07

Implementation of DAPSC component

All India Research Coordinated Project (AICRP) on Poultry Breeding, Mannuthy centre had implemented the ICAR DAPSC scheme for the year 2022-23 by supplying 10 numbers of around 8 weeks old vaccinated Tellichery native chicken worth Rs. 1000, a wooden coop worth Rs. 2900 and five kgs of feed worth Rs. 200 each to 55 scheduled caste farmers of Velinalloor grama panchayat and 55 scheduled caste farmers of Alayamon grama panchayat of Kollam district, Kerala.

Supply of germplasm

Total germplasm supply from the centre was 68,220 and 625 farmers were benefitted through the supply of germplasm during 2022-23.

Revenue generation

The centre has generated Rs.16.49 lakhs during 2022-23 which is 120.87 % of the recurring expenditure on feed Rs.13.64 lakhs. The total recurring expenditure was Rs. 18.64 lakhs.

Anand Agricultural University, Anand (Gujarat)

Activities assigned

- Conservation, characterization and improvement of *Ankleshwar* breed of chicken.
- Egg production up to 64 weeks of age continues to be the selection criterion in IWN and IWP strains.
- To maintain all the surviving birds of first hatch to record egg production till 72 weeks of age in IWN and IWP strains.
- To participate with IWN X IWP cross in RSPP tests being conducted by Govt. of India.
- Development of location specific chicken variety (egg type)

Action taken

- The S-3 generation of *Ankleshwar* chicken was evaluated up to 40 weeks of age.
- The S-4 generation of *Ankleshwar* chicken was produced and is being evaluated.
- The S-3 generation of IWN and IWP strains was evaluated up to 40 weeks of age.
- The S-10 generation of IWD and IWK strains was evaluated up to 40 weeks of age.

Achievements

A. Development of location specific rural germplasm (egg type)

Evaluation of *Ankleshwar* chicken germplasms (S-3 gen.)

During the reporting period, S-3 generation of *Ankleshwar* breed was evaluated up to 40 weeks of age. A total of 1,300 pullets of *Ankleshwar* chicken were housed individually at 16 weeks of age and evaluated up to 40 weeks of age. Chicks of S-4 generation of *Ankleshwar* chicken was produced and is being evaluated.

Incubation records

Fertility was higher in S-4 generation as compared to S-3 generation. Hatchability (FES) was lower in S-4 generation as compared to S-3 generation (Table 1).

Table 1. Incubation records of *Ankleshwar* breed during last three generations

Gen.	Eggs set (Nos.)	Good chicks (Nos.)	Fertility (%)	Hatchability (%)	
				TES	FES
S-2	6269	3841	77.68	63.23	81.40
S-3	5935	3972	80.81	71.78	88.82
S-4	**5528**	**3698**	**88.55**	**70.17**	**79.24**

Production performance

The *Ankleshwar* breed was evaluated up to 40 weeks of age during S-3 generation. Age at sexual maturity was increased in S-3 generation of *Ankleshwar* chicken in comparison to S-1 and S-2 generations. Body weight at 16 and 40 weeks of age was almost similar in S-3 generation as compared to S-2 generation. Egg production up to 40 weeks of age was almost similar in S-3 generation as compared to S-2 generation. Egg weight at 28 and 40 weeks of age was almost similar in S-1, S-2 and S-3 generations (Table 2).

Mortality

Mortality of birds during 0-8, 9-16 and 17-40 weeks of age was within permissible range in S-0, S-1, S-2 and S-3 generations (Table 3).

B. Improvement of IWN and IWP strains of White Leghorn

During the period under report the S-3 generation of IWN and IWP strains was evaluated up to 40 weeks of age. The summary of selection records of IWN and IWP strains is presented in Table 4.

Table 2. Production performance of *Ankleshwar* breed

Traits	S-3 Gen.		S-2 Gen.		S-1 Gen.	
	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
No. of pullets housed	1300	-	1220	-	1310	-
ASM (d)	1295	151.1±0.36	1212	145.5±0.36	1058	150.8±0.32
Body weight (g)						
16 wks	1300	962±2.69	122v0	966±2.58	1310	937±2.66
40 wks	1119	1556±5.71	1170	1571±5.77	1033	1548±4.95
EP 40 wks (Nos.)						
Survivors'	1119	83.3±0.45	1170	81.5±0.71	1033	76.4±0.63
Hen housed	1300	79.4±1.25	1220	79.9±0.74	1310	65.6±0.70
Hen day	-	82.85	-	80.27	-	73.30
Egg weight (g)						
28 wks	1206	38.24±0.10	1068	37.45±0.09	1024	37.81±0.11
40 wks	934	42.92±0.12	887	42.63±0.12	774	42.73±0.13
Feed cons./bird (kg) 17-40 wks	-	16.85	-	16.87	-	16.08

Table 3. Mortality in *Ankleshwar* breed during different periods

Gens.	0-8 wks			9-16 wks			17-40 wks		
	No. Housed	No. Died	Mortality (%)	No. Housed	No. Died	Mortality (%)	No. Housed	No. Died	Mortality (%)
S-1	3615	141	3.90	3474	75	2.16	1310	68	5.19
S-2	3841	161	4.19	2900	23	0.79	1220	50	4.10
S-3	**3972**	**135**	**3.40**	**2932**	**34**	**1.16**	**1300**	**53**	**4.08**

Incubation records

The summary of incubation records of IWN, IWP and Control population is presented in Table 5. Fertility and hatchability were higher in control population as compared to IWN and IWP strains in S-3 generation. The fertility and hatchability in IWP strain have come down in the present generation.

Mortality

Mortality in IWN, IWP and control population was under permissible limit during 0-8, 9-16 and 17-40 weeks of age except in IWP strain in the present generation during 0-8 weeks of age (Table 6).

The ASM, egg production and egg weight of IWN and IWP and control population recorded over three generations are presented in Table 7.

Table 4. Selection records of IWN and IWP strain in S-2 to S-3 generation

Sl. No.	Particulars	IWN	IWP
1	No. of sires used	50	50
2	No. of dams used	250	250
3	No. of sires contributed to the next generation	50	50
4	No. of dams contributed to the next generation	192	182
5	Effective Nos. using Sr. No.3 & 4	158.68	156.90
6	Rate of inbreeding	0.00315	0.00319
7	Expected S. D. in females of S-2 generation	9.79	8.16
8	Phenotypic standard deviation of S-2 generation	34.01	40.23
9	Intensity of selection	0.288	0.203
10	Heritability of 64 weeks egg production of S-2 generation	0.30	0.35
11	Expected response	2.94	2.86

Table 5. Incubation records of IWN, IWP and control population over the generations

Gens.	Strains	Eggs set (Nos.)	Good chicks (Nos.)	Fertility (%)	Hatchability (%)	
					TES	FES
S-1	IWN	1258	890	88.31	74.64	84.52
	IWP	1455	1001	86.12	73.20	85.00
	Control	812	661	89.66	83.50	93.13
S-2	IWN	1432	1061	85.68	76.54	89.32
	IWP	1385	930	84.26	70.83	84.06
	Control	786	622	85.62	80.41	93.91
S-3	IWN	1603	1105	83.78	71.30	85.11
	IWP	1337	780	74.50	62.60	84.04
	Control	809	654	87.52	82.20	93.93

Table 6. Mortality of IWN, IWP and Control population over the generations

Gens.	Strains	0-8 wks	9-16 wks	17-40 wks	41-64 wks	17-64 wks
S-0	IWN	4.23	2.38	3.41	0.84	4.23
	IWP	3.02	1.13	2.10	0.66	2.74
	Control	4.00	0.69	1.60	2.70	4.26
S-1	IWN	2.96	4.35	2.69	2.76	5.38
	IWP	4.83	0.56	1.99	1.45	3.42
	Control	4.52	1.28	1.11	2.25	3.33
S-2	IWN	4.15	10.30	4.01	3.90	7.75
	IWP	7.31	1.91	4.51	9.44	13.52
	Control	4.30	7.27	5.56	6.47	11.67
S-3	IWN	**2.44**	**0.51**	**2.29**	-	-
	IWP	**8.59**	**1.54**	**0.00**	-	-
	Control	**3.36**	**4.15**	**1.62**	-	-

Table 7. ASM and egg weight in IWN, IWP and control population over three generations

Traits	Gens.	IWN	IWP	Control
ASM	S-1	133.8	130.9	145.7
	S-2	138.7	133.2	140.7
	S-3	**143.9**	**140.3**	**149.6**
EP 40 wks	S-1	130.50	133.40	107.75
	S-2	126.77	124.95	108.59
	S-3	**121.06**	**126.59**	**101.07**
EW40	S-1	52.05	52.69	52.34
	S-2	52.62	52.87	52.93
	S-3	**52.38**	**52.07**	53.33

Production performance of IWN, IWP and Control population

The production performance of IWN, IWP and control population during S-3 generation is presented in Table 8. A total of 350, 350 and 185 pullets of IWN, IWP and control population, respectively were housed individually at 16 weeks of age.

Growth performance

Body weight recorded at 16 and 40 weeks of age was almost similar among IWN, IWP and control population in S-3 generation (Table 8).

Egg production performance

Egg production up to 40 weeks of age was lower in IWN and Control birds in S-3 generation as compared to S-2 generation (Table 7). Egg production up to 40 weeks of age was higher in IWP strain in S-3 generation as compared to S-2 generation (Table 7). Egg production up to 40 weeks of age was higher in IWP strain as compared to IWN strain in S-3 generation (Table 8).

Age at sexual maturity and egg weight

Age at sexual maturity was less in IWP strain as compared to IWN strain and control population in S-3 generation. Egg weight at 28 and 40 weeks of age was almost similar in IWN, IWP and control population in S-3 generation (Table 8).

Feed consumption

Feed consumption during 17-40 weeks of age in IWN, IWP and control population in S-3 generation was almost similar (Table 8).

Frequency distribution

The frequency distribution of egg production up to 40 weeks of age in IWN and IWP strains in S-3 generation was maximum in the class interval of 121-130, while in control population, it was maximum in the class interval of 101-110 (Table 8).

Heritability estimates

In IWN strain (S-3 generation), heritability estimate of EW28 was low in magnitude, whereas, heritability estimates of BW40, egg production up to 40 weeks and EW40 was medium in magnitude and it was high in magnitude for ASM and BW16 (Table 11). In IWP strain (S-3 generation), heritability estimate of BW16 was medium in magnitude and it was high in magnitude for ASM, BW40, egg production up to 40 weeks, EW28 and EW40 (Table 10).

Egg quality

The egg quality traits measured at 40 weeks of age in both IWN and IWP strains of White Leghorn of S-3 generation are presented in Table 11. The egg weight and was significantly better in IWN strain while shell thickness was better in IWP strain. No significant difference was seen for other egg quality traits.

C. Maintenance of IWD and IWK strains of White Leghorn

Incubation records

The summary of incubation records of IWD and IWK strains during last three generations is presented in Table 12. Fertility and hatchability were higher in S-10 generation as compared to S-9 generation of IWD and IWK strains.

Production performance of IWD and IWK strains (S-10 gen.)

Performance of IWD and IWK strains in S-10 generation is presented in Table 13. Age at sexual maturity in IWD and IWK strains was almost similar. Body weight at 16 and 40 weeks of age in IWD and IWK strains was almost similar. Egg production up to 40 weeks of age was higher in IWD strain as compared to IWK strain. Egg weight at 28 and 40 weeks of age was almost similar in both the strains. Feed consumption was almost similar in both the strains. Mortality was within permissible limit in both the strains.

Table 8. The performance of IWN, IWP and Control population (S-3 gen.)

Traits	IWN		IWP		Control	
	N	**Mean ± S.E.**	**N**	**Mean ± S.E.**	**N**	**Mean ± S.E.**
ASM (d)	350	143.9±0.61	349	140.3±0.65	183	149.6±0.91
Body weight (g)						
16 wks	350	1023±4.38	350	1032±3.14	185	1007±4.70
40 wks	342	1666±7.07	350	1668±8.11	182	1616±12.00
EP 40 wks (Nos.)						
Survivors'	342	121.1±0.89	350	126.6±0.90	182	101.1±1.34
Hen housed	350	119.6±4.13	350	126.6±0.90	185	100.3±4.24
Hen day	-	120.98	-	126.59	-	101.03
Egg weight (g)						
28 wks	334	50.25±0.25	339	50.57±0.25	166	50.54±0.22
40 wks	340	52.38±0.17	333	52.07±0.19	180	53.33±0.22
Feed consumption / bird (kg)						
0-08 wks	-	1.58	-	1.61	-	1.54
9-16 wks	-	3.42	-	3.45	-	3.48
17-40 wks	-	17.45	-	17.56	-	17.77
Mortality (%)						
0-08 wks	-	2.44	-	8.59	-	3.36
9-16 wks	-	0.51	-	1.54	-	4.15
17-40 wks	-	2.29	-	0.00	-	1.62

Table 9. Frequency distribution of egg production up to 40 weeks (S-3 gen.)

Class Interval	IWN		IWP		Control	
	No	%	No	%	No	%
<61	06	1.75	13	3.71	04	2.20
61-70	01	0.29	00	0.00	04	2.20
71-80	04	1.17	03	0.86	13	7.14
81-90	07	2.05	01	0.29	15	8.24
91-100	19	5.56	09	2.58	39	21.43
101-110	34	9.94	16	4.58	**52**	**28.57**
111-120	64	18.71	44	12.61	40	21.98
121-130	**110**	**32.16**	**107**	**30.66**	12	6.59
131-140	74	21.64	104	29.80	03	1.65
141-150	23	6.73	49	14.04	00	0.00
151-160	00	0.00	04	1.15	00	0.00
Total	342	100.0	350	100.0	182	100.0

Table 10. Heritability estimates (Sire component) in IWN and IWP strains (S-3 gen.)

Trait		IWN	IWP
Age at first egg		0.20±0.18	0.24±0.22
Body wt. at 16 wks		0.26±0.16	0.16±0.21
Body wt. at 40 wks		0.18±0.15	0.39±0.21
EP 40 wks		0.10±0.15	0.38±0.23
Egg wt.	28 wks	0.02±0.17	0.29±0.20
	40 wks	0.11±0.15	0.33±0.21

Table 11. Egg quality traits in IWN and IWP strains at 40 weeks of age (S-3 gen.)

Egg quality traits	Strain		P Value
	IWN	IWP	
Egg weight (g)	53.52 ± 0.36[a]	52.19 ± 0.36[b]	P <0.01
Albumen height (mm)	6.02 ± 0.076	6.07 ± 0.075	NS
Albumen Index	0.064 ± 0.001	0.062 ± 0.001	NS
Yolk Index	0.360 ± 0.003	0.359 ± 0.003	NS
Shell thickness (mm)	0.33 ± 0.002[b]	0.34 ± 0.002[a]	P <0.01
Haugh unit	78.74 ± 0.582	79.60 ± 0.558	NS
Blood Spot (%)	0.00	0.00	-
Meat Spot (%)	0.00	0.00	-

Table 12. Incubation records of IWD and IWK strains during last three generations

Gens.	Strains	Eggs set (Nos.)	Good chicks (Nos.)	Fertility (%)	Hatchability (%)	
					TES	FES
S-8	IWD	908	657	95.48	74.78	78.31
	IWK	881	649	95.69	78.32	81.85
S-9	IWD	1183	734	78.78	65.43	83.05
	IWK	987	659	80.04	69.30	86.58
S-10	IWD	**1067**	**791**	**89.32**	**78.91**	**88.35**
	IWK	**981**	**756**	**89.91**	**80.73**	**89.80**

Table 13. The production performance of IWD and IWK strains (S-10 gen.)

Traits	IWD		IWK	
	N	Mean ± S.E.	N	Mean ± S.E.
No. of pullets housed	225	-	225	-
ASM (d)	224	140.67 ± 0.68	221	141.29±0.89
Body weight (g)				
16 wks	225	1094±5.10	225	1046±6.03
40 wks	223	1520±8.84	217	1543±10.35
EP 40 wks (Nos.)				
Survivors'	223	109.8±1.27	217	102.0±1.53
Hen housed	225	108.6±3.65	225	98.1±3.24
Hen day	-	109.2	-	99.02
Egg weight (g)				
28 wks	217	50.02±0.25	208	50.70±0.26
40 wks	215	52.26±0.25	210	53.02±0.24
Feed consumption / bird (kg)				
0-8 wks	-	1.55	-	1.61
9-16 wks	-	3.47	-	3.59
17-40 wks	-	17.65	-	17.94
Mortality (%)				
0-8 wks	-	3.67	-	4.37
9-16 wks	-	0.79	-	2.90
17-40 wks	-	0.89	-	3.56

Implementation of DAPSC component

A total 14 beneficiaries of nearby taluks of Anand and Kheda districts were selected. They were briefed about the objectives of SCSP component of AICRP on Poultry Breeding, benefits to be given to them by this centre and their responsibilities regarding related aspects of rearing and maintenance of birds. Simultaneously, chicks of "*Ankleshwar"* breed were produced and reared at Poultry Research Station. "Training and Kit Distribution Programme" under SCSP component of AICRP on Poultry Breeding (ICAR) was organized on 03-03-2023 at Poultry Research Station. Each beneficiary was given one unit as input. One unit included 35 numbers of grownup chicks of "*Ankleshwar"* breed, one feeder, one drinker, one catching crate (as Night Shelter), 50 kg poultry feed (Grower mash), 20 plastic egg trays, vitamin supplements and one text book of "Poultry Production" in Gujarati language.

Germplasm supply

The centre has supplied a total of 43,146 germplasms during the year 2022-23. A total of 824 farmers were benefited, among them, 79 farmers were directly benefited and 745 farmers were benefited through KVK and NGO. The germplasm supply was lower during the year 2022-23 as compared to previous year because breeder stock was sold in the month of January-2023 due to constraint in the budget.

Revenue generation

The center has generated the revenue of Rs. 29.08 lakhs during the reporting period, which was 68.46% of the total expenditure of feed cost (42.48 lakhs). The total expenditure incurred on feed was Rs. 42.48 lakhs.

Karnataka Veterinary, Animal and Fishery Sciences University, Bengaluru (Karnataka)

Activities assigned

- Evaluation of local native chicken germplasm,
- To improve PB-1 and PB-2 lines for growth and production traits
- To evaluate the control population to measure environmental trend.
- Farm and field evaluation of the crosses.

Action taken

- Local native chicken was evaluated for growth and production in S-6 generation
- Production traits of PB-1 (S-14), PB-2 (S-27) and Control lines were evaluated.
- The S-15 and S-28 generations of PB-1 and PB-2 along with Control lines were regenerated and evaluated for juvenile traits.
- Filed evaluation of PB-1 X PB-2 cross was undertaken.

Achievements

Collection, conservation and evaluation of native germplasm

Purification of native chicken germplasm was completed for six generations. The solid black coloured and pure white plumage birds were culled and uniform attractive plumage coloured birds were retained. S-6 generation of native chicken was produced and about 1074 good chicks obtained. The S-6 generation of native chicken was evaluated for growth traits up to52 week of age and production traits up to 72 weeks of age (Table 1). Overall means of body weight of combined sex at 8, 20, 40 and 52 weeks was 254.6, 1082, 1340 and 1455 g. There is reduction in egg weights in this generation as compared to the previous generation. There is reduction in the egg production as compared to previous generation.

Table 1. Body weight, ASM and egg weight in native birds (S-6)

Traits	Mean ± SE (No.)	
Body weight (g)	Male	Female
8 wks	317.0±7.81(76)	248.8±2.33(813)
20 wks	1243±17.01(75)	1067± 5.07(803)
40 wks	1864± 27.27 (94)	1273± 21.89 (734)
52 wks	1945± 25.52 (96)	1389±7.42 (713)
Egg weight (g)		
28 wks		37.33 (360)
40 wks		42.10 (300)
52 wks		43.19 (210)
EP 40 wks (Nos.)		
Hen housed		22.10±3.56 (800)
Survivors'		23.78±±.69 (734)
EP 52 wks (Nos.)		
Hen housed		27.05±3.28 (800)
Survivors'		30.35±3.47 (713)
EP 72 wks (Nos.)		
Hen housed		49.67 ± 2.80 (800)
Survivors'		62.78 ± 3.15 (633)

Conservation and utilization of elite germplasm

Selection records

The number of sires and dams used in regeneration were 24 and 186 in PB-1, 23 and 183 in PB-2, respectively. The effective number of parents was 85 in PB-1 and 81 in PB-2. The rate of inbreeding was 0.006 and 0.006 in PB-1 and PB-2 populations, respectively. Summary of selection records of PB-1 and PB-2 are presented in Table 2. There is a reduction in sires and dams used for regeneration and efforts are to be made to increase the number of sires and dames to maintain optimum effective population size.

Table 2. Summary of selection records

Parameters	PB-1		PB-2	
	S-14	S-15	S-27	S-28
Sires	32	24	31	23
Dams	240	186	224	183
Sires contributed	31	24	31	23
Dams contributed	232	186	224	183
Effective number	112	85	109	81
Rate of Inbreeding	0.001	0.006	0.002	0.006
SD for male (g)	148	131.9	142	173.9
SD for female (g)	58	40.8	55	50.4
Average selection differential (g)	76	86.4	66	112.2
Selection intensity (σ)	0.51	0.56	0.44	0.63

Incubation records

The fertility and hatchability records of PB-1, PB-2 and control populations are presented in Table 3. During the current year, a total of 530, 403 and 169 good chicks were hatched in PB-1, PB-2 and Control populations, respectively. Efforts may be made to increase the number of chicks in PB-1 and PB-2 lines, to perform optimum performance evaluation and selection.

Table 3. Incubation records for PB-1, PB-2, and control line

Gen.	Eggs set (Nos.)	Fertility (%)	Good chicks (Nos.)	Hatchability (%)	
				TES	FES
PB-1					
S-14	1332	83.71	920	71.17	85.02
S-15	**675**	**88.59**	**530**	**80.00**	**90.30**
PB-2					
S-27	1207	86.33	850	71.91	83.30
S-28	**568**	**84.33**	**403**	**72.89**	**86.43**
Control					
S-28	**208**	**87.50**	**169**	**82.21**	**93.95**

Mortality

The mortality in the present generation during 0 to 5 weeks was 3.02, 1.74 and 2.96% in PB-1, PB-2 and Control lines, respectively. Mortality during 6-16 weeks and 17-40 weeks of age significantly decreased in both the broiler parent lines (Table 4).

Table 4. Mortality (%) for PB-1, PB-2 and control line

Gen.	0-5 wks	6-16 wks	17-40 wks
PB-1			
S-14	4.02	24.80	29.64
S-15	**3.02**	**3.89**	**2.08**
PB-2			
S-27	2.24	29.36	20.75
S-28	**1.74**	**2.78**	**2.60**
Control			
S-28	2.96	1.83	0.00

Juvenile body weight and feed efficiency

The day-old body weight recorded in PB-1, PB-2 and control lines were 40.72, 40.58 and 37.75 g, respectively. There was an improvement in five weeks body weight in both PB-1 and PB-2 lines as compared to previous generation. In the current year, there was a decline in feed conversion efficiency in both the parent lines as compared to previous generation (Table 5).

Table 5. Juvenile traits over last two generations in PB-1, PB-2 and Control line

Gen.	Body weight (g)		Feed efficiency (0-5 wks)
	Day old	5 wks	
PB-1			
S-14	41.69 (920)	956.2±7.50 (883)	2.16
S-15	**40.72 (530)**	**1082±10.85 (514)**	**2.21**
PB-2			
S-27	41.60 (850)	947.2± 8.41 (831)	2.15
S-28	**40.58 (403)**	**1017± 9.06 (396)**	**2.18**
Control			
S-28	37.75 (169)	784.9±10.6 (164)	2.76

Frequency distribution of 5 weeks body weight

Frequency distribution for body weight at 5 weeks of age in both the lines is presented in graphical form below (Fig 1)

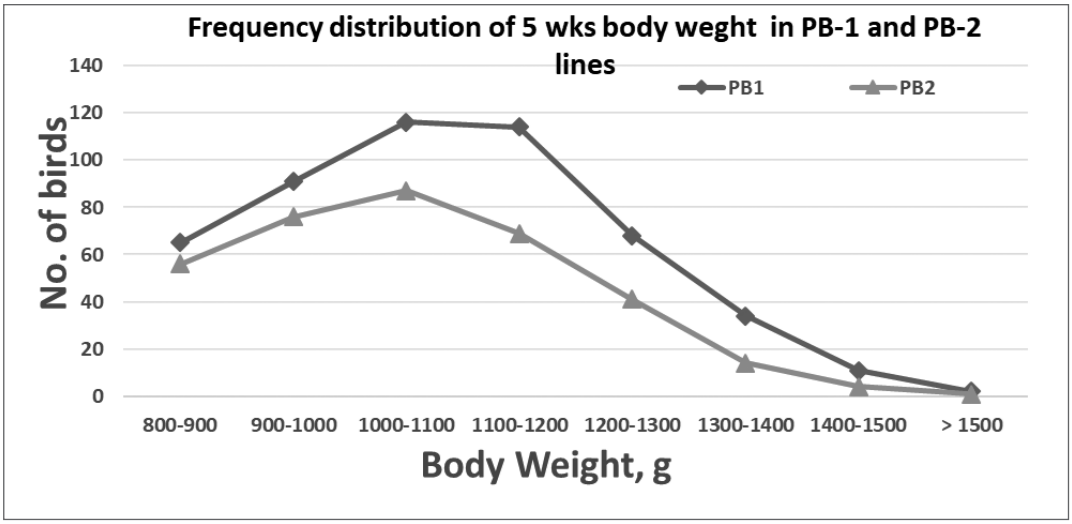


Fig 1. Frequency distribution of 5 weeks body weight in PB-1 and PB-2 lines

Production performance

The production performance in PB-1, PB-2 and control lines up to 52 weeks of age over last two generations are presented in Tables 6, 7 and 8. The average body weight at 20 weeks recorded in PB-1 (S-15) was 2120±29.34 g. Corresponding values in PB-2 (S-28) was 2080±32.59 g, respectively.

The ASM recorded in S-14 of PB-1 and S-27 of PB-2 lines were 196.05 and 209.62 days, respectively. Increase of ASM was observed in both PB-1 and PB-2 line. There is reduction in weight of egg at 40 weeks of age in both the parent lines compared to previous generation. Egg weights at 32 and 40 weeks of age were below the optimum level in both the lines and necessary measures are to be taken to improve the same.

Table 6. Adult body weight at 20 and 40wks of females in different lines

Gen.	Body weight (g)	
	20 wks	40 wks
PB-1		
S-13	2465± 18.45 (353)	3103± 23.64 (244)
S-14	2027± 30.94 (223)	**3152±32.34 (186)**
S-15	2120±29.34 (216)	NC
PB-2		
S-26	2328 ± 20.05 (243)	3237 ± 18.18 (233)
S-27	2086±28.23 (192)	**2894±29.26 (183)**
S-28	2080±32.59 (167)	NC
Control		
S-28	1520±±0.06 (107)	NC

* Figures in parenthesis indicate number of observations

Table 7. Age at sexual maturity and egg weights in different lines

Gen.	ASM (days)	Egg wt (g) at 32 wks	Egg wt (g) at 40 wks
PB-1			
S-13	193.32± 0.58 (238)	55.20± 0.30 (220)	61.78±0.37 (100)
S-14	196.05 ± 1.22 (164)	54.50 ± 0.52 (160)	55.70 ± 0.44 (170)
PB-2			
S-26	198.97±0.74 (231)	54.92±0.29 (100)	62.97±0.43 (100)
S-27	209.62 ± 0.66 (123)	54.53 ± 0.46 (150)	58.23 ± 0.49 (115)
Control			
S-28	-	--	

* Figures in parenthesis indicate number of observations

The average egg production at 40 weeks of age (survivor basis) in PB-1 and PB-2 lines in the latest generation were 37.41 and 29.43 eggs, respectively. Corresponding production at 52 weeks of age were 65.06 and 54.34 eggs, respectively. The egg production up to 40 and 52 weeks of age decreased in all two parent lines. The centre did not report the reasons for the reduction.

Response

The average phenotypic and genetic response of 5 weeks body weight in PB-1 was 7.88 (15 generations) and 20.61g (15 generations), respectively. Corresponding values for egg production up to 40 weeks of age in PB-1 was -1.6 (15 generations) and -1.2 eggs (13 generations) (Fig 2 and 4). The average phenotypic and genetic response of 5 weeks body weight in PB-2 was 4.34 (15 generations) and 12.98 g (14 generations), respectively (Fig 3 and 5). Corresponding values for egg production in PB-2 up to 40 weeks was -2.02 (15 generations) and -1.13 eggs (14 generations).

Table 8. Production performance of females

Gen.	Egg production (Nos.)	
	40 wks	52 wks
PB-1		
S-13	43.59±0.77 (244)	65.51±0.81 (240)
S-14	37.41±0.89 (186)	65.06±1.33 (178)
PB-2		
S-26	28.38±0.60 (233)	65.82±0.59 (224)
S-27	29.43±0.90 (183)	54.34±1.17 (178)
Control		
S-28	-	-

* Figures in parenthesis indicate number of observations

Field Evaluation of PB-1 X PB-2 Cross

Raja –II (PB-1 x PB-2 cross) was evaluated under field condition. A total of 250 Raja II chicks were reared under intensive management. The body weight at 6 and 7 weeks was 1500 and 1950 g with 2.17 FCR (up to 7 weeks) and 96

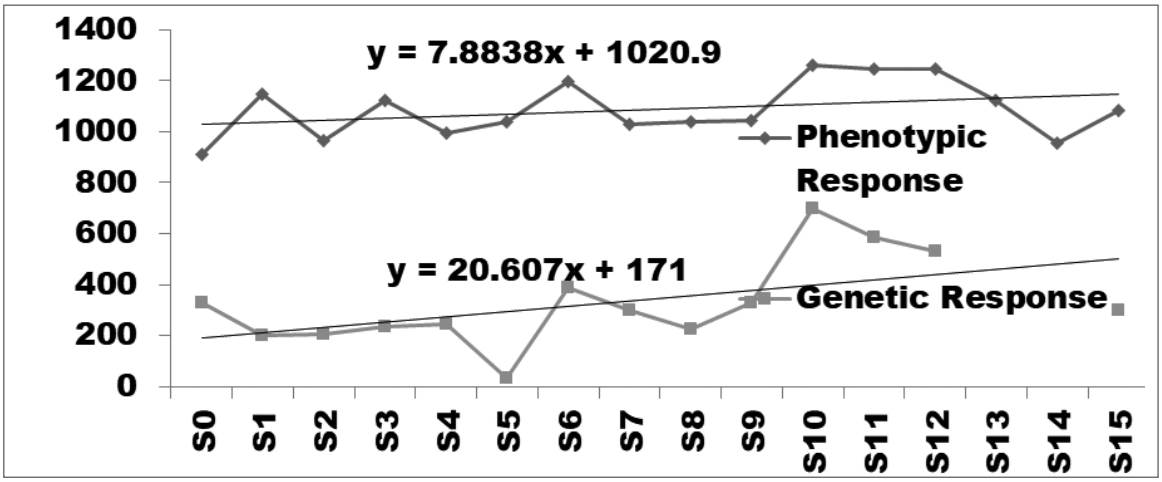


Fig 2. Genetic and phenotypic response to 5 weeks body weight in PB-1

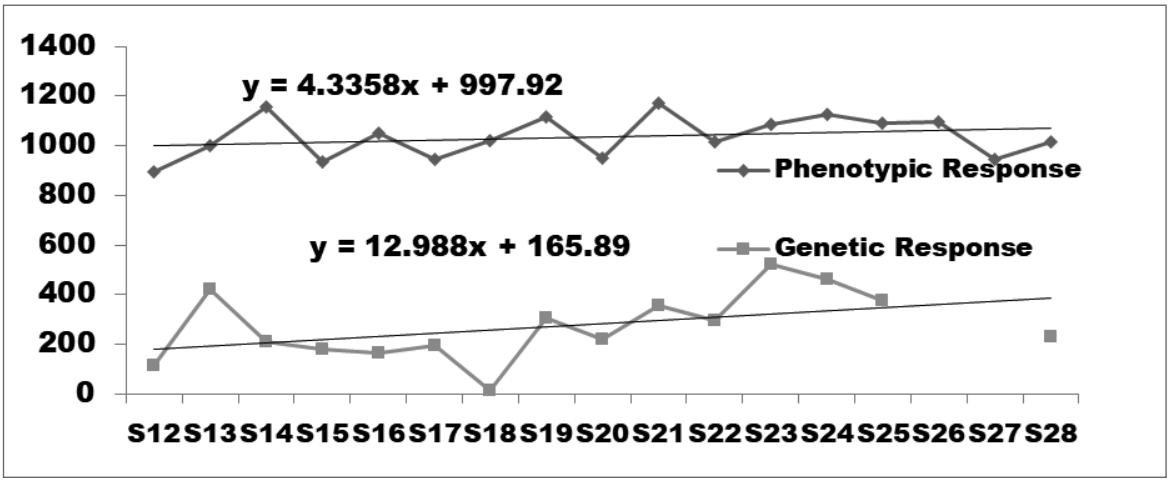


Fig 3. Genetic and phenotypic response to 5 weeks body weight in PB-2

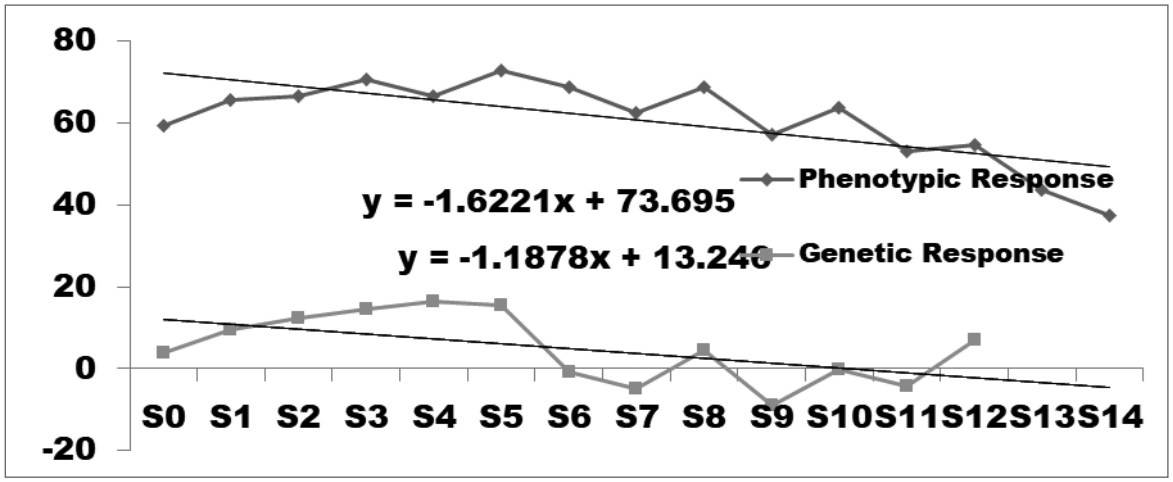


Fig 4. Genetic and phenotypic response of egg production up to 40 wks in PB-1

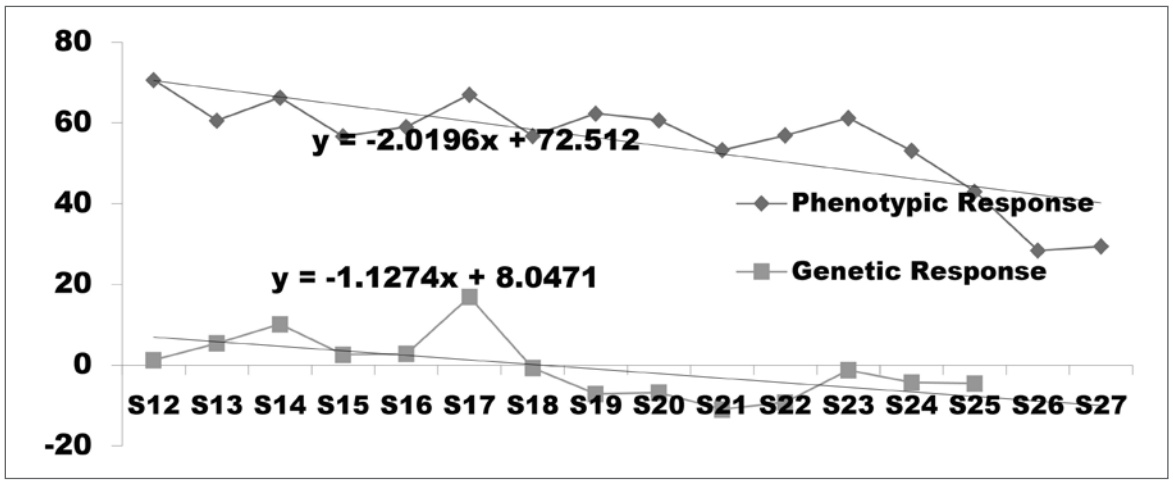


Fig 5. Genetic and phenotypic response of egg production up to 40 wks in PB-2

% survivability. The farmer got a net profit of Rs. 9559 by rearing a unit 250 Raja-II birds.

Economics of rearing commercial Raja II (PB-1 &PB-2) birds at field level

No. of chicks reared: 250
Average 6th week body weight: 1.50 kg
Average 7th week body weight: 1.95 kg
FCR : 2.17
Survivability : 96.00%

1. Expenditure (in Rs)

Cost of chick 250 X Rs.16	= 4,000
Cost of feed (approx) up to 6 weeks 240 birds X 3.30kg feed X Rs.32	= 25,344
Other expenditure 250 birds X Rs.10	= 2,500
Total Expenditure	= 31,844

2. Income (in Rs)

240 birds X 1.50kg X Rs.115	= 41,400
Profit (approx., (in Rs)) 41,400- 31,844	= **9,556**

Participation in RSBPT for broilers

The center participated in the 55th RSBPT for Broilers 2022 at Gurgaon, Haryana during 2022-23. The average body weights at 6 and 7 weeks of age were 1420 gm and 1796 gm in Raja - II (PB1 x PB2). The feed efficiency was 2.33 between 0 - 7 weeks. The dressing percentage was 70.30.

Implementation of DAPSC component

Under SCSP component, one training program was conducted and 40 farmers have participated. Inputs were given to 25 beneficiary farmers and landless labourers for Neralaghatta (V), Doddaballapur (D), Bangaluru Rural.

Germplasm supply

A total of 1,68,535 Nos. germplasm (1,68,525 day old chicks and 10 hatching eggs) were supplied to farmers and other stakeholders (310 beneficiaries) during the period under report.

Revenue generation

The centre generated revenue of Rs. 44.37 lakhs which was 137.5% of expenditure on feed cost (Rs. 32.26 lakhs).

Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (Punjab)

Activities assigned

Evaluation of *Punjab Brown* germplasm.

Evaluation of PB-2 X *Punjab Brown* dual cross.

To evaluate and improve the PB-2 and PB-1 populations as a broiler dam and sire lines.

To evaluate a control population for evaluating the environmental fluctuations.

Action taken

Centre evaluated the S-7 generation of *Punjab Brown* chicken germplasm.

PB-2 X *Punjab Brown* cross evaluated at farm.

The centre regenerated S-15 generation of PB-1 and S-47 generation of PB-2 population.

Achievements

Evaluation of *Punjab Brown* germplasm

S-7 generation was were reproduced utilising 50 sires and 150 dams. Average selection differential for body weight at 8 weeks was 124.03 g. A total of 1785 fertile eggs of *Punjab Brown* were set for hatching in S-7 generation. The fertility was 93.84%. The hatchability percent on TES and FES were 93.13 and 87.39, respectively. The body weight of *Punjab Brown* chicks at 4 and 8 weeks of age were 373.3, 691.5 g in males and 324.1, 633.3 g in females, respectively (Table 1). The mortality percent in native chicken in different age groups of 0-8, 9-20, 21-40 were 4.57, 3.51 and 2.63, respectively. ASM of *Punjab Brown* was 168.33 days and egg production up to 36 weeks was 55.25 eggs. Egg weight at 36 weeks of age was 50.72 g. Egg production up to 52 weeks of age was 110.67 eggs. There is an improvement in egg production at 36 and 52 weeks as compared to previous generation. The heritability estimates for body weight at 8 weeks, 20 weeks, ASM and 40 weeks egg production were 0.27, 0.32, 0.19 and 0.31, respectively based on the half sib analysis.

Evaluation of cross

Farm evaluation of dual-purpose cross (PB-2 x *Punjab Brown*) was undertaken. The body weight of cross at 4, 8, 16 and 20 weeks of age were 366.3, 841.2, 1712 and 2060 g, respectively. The mortality percent in dual purpose cross in age groups of 0-8, 9-20, 21-40 were 5.63, 2.86 and 0.74, respectively in farm. ASM and egg production up to 36 weeks in was 170.2 days and 57.80 eggs, respectively. Egg weight at 36 weeks of age was 51.48 g. Egg production up to 52 weeks of age was 145 eggs. There is reduction in egg production and egg weight as compared to previous evaluation.

Table 1. Comparative performance of *Punjab Brown* (S-7) and its cross with PB-2 at farm

Traits	*Punjab Brown* (Male)		*Punjab Brown* (Female)		**Dual-purpose cross (PB2 x *Punjab Brown***	
	N	Mean±SE	N	Mean ± SE	N	Mean
Body weight (g)						
4 wks	120	373.3±4.38	285	324.1±5.22	120	366.3±2.13
8 wks	110	691.5±8.72	280	633.3±8.35	110	841.2±10.21
16 wks	110	1512±8.13	270	1408±7.77	100	1712±12.17
20 wks	110	2140±15.61	270	1955±6.56	100	2060±15.44
36 wks	100	3024±7.48	265	2592±9.52	95	2873±24.77*
52 wks	100	3712±17.45	250	3155±17.05	-	-
FCR (0-8 wks)	-	3.80 (M+F)			-	3.50
ASM (d)	-	-	270	168.33±0.44	50	170.22±1.05
EW at 36 wks (g)	-	-	135	50.72±1.04	45	51.48±0.73
EP 36 wks (Nos)	-	-	245	55.25±9.11	45	57.80±7.81
EP 52 wks (Nos)			217	110.67±13.18	40	145.06±5.11

*BW at 40wks

Conservation and utilization of elite germplasm

Selection records

Summary of selection records over the last two generations for PB-1 and PB-2 are presented in Table 2. The PB-1 and PB-2 populations were reproduced utilizing 70 sires and 350 dams during S-15 and 70 sires and 350 dams during S-47 generations, respectively. There is increase in the selection differential during this generation compared to previous generation in both the lines.

Table 2. Summary of selection records in last two generations in PB-1 and PB-2

Parameters	PB-1		PB-2	
	S-15	S-14	S-47	S-46
Sires	70	70	70	70
Dams	350	350	350	350
Sires contributed	70	70	70	70
Dams contributed	350	350	350	350
Effective number	233.33	233.33	233.33	233.33
Rate of inbreeding	0.0021	0.0021	0.0021	0.0021
Average Expected selection differential	183.03	91.32	73.49	41.78
Expected response	23.76	15.52	9.55	7.10

Incubation records

During the current generation, a total of 3652, 3427 and 510 good chicks were hatched in PB-1, PB-2 and Control populations, respectively (Table 3). The fertility was 93.24, 93.45 and 92.54% in PB-1, PB-2 and control lines. The hatchability on total eggs set was 87.61, 83.77 and 80.95 in PB-1, PB-2 and control lines, respectively. The hatchability slightly reduced as compared to last generation in PB-2 line.

Table 3. Incubation records for PB-1, PB-2 and control line

Gen./ year	Eggs set (Nos.)	(%)	Good chicks (Nos.)	Hatchability (%)	
				TES	FES
PB-1					
S-14	3577	93.79	3142	87.74	93.65
S-15	4172	93.24	3652	87.61	93.96
PB-2					
S-46	3667	93.95	3333	91.14	97.01
S-47	4110	93.45	3427	83.77	89.64
Control					
2021-22	204	88.73	169	82.84	93.37
2022-23	630	92.54	510	80.95	87.48

Mortality

The mortality reported in PB-1, PB-2 and control lines were 5.15, 4.58 and 4.71%, respectively during 0-5 week (Table 4). During grower period mortality of 5.69, 4.88 and 4.36% was recorded in PB-1, PB-2 and control, respectively.

Table 4. Mortality percentage at different ages in PB-1, PB-2 and control lines

Gen.	Mortality (%)		
	0-5 wks	6-20 wks	21-40 wks
PB-1			
S-14	6.08	5.46	3.05
S-15	5.15	5.69	3.82
PB-2			
S-46	5.10	4.93	2.80
S-47	4.58	4.88	3.41
Control			
2021-22	5.88	4.71	4.32
2022-23	4.71	4.36	2.55

Body weight

During current generation the average body weight at 5 weeks of age was 1190, 1094 and 887.6 g in PB-1, PB-2 and Control lines, respectively (Table 5). The feed efficiency up to 5 weeks of age was maintained in all the three lines. The body weight at 5 weeks of age deceased in PB-1, PB-2 and control lines as compared to previous generation.

Table 5. Body weight (g) and feed efficiency at 5 weeks during last two generations

Gen./year	Body wt. 5 wks	Feed efficiency (up to 5 wks)
PB-1		
S-14	1241±3.37 (1510)	1.88
S-15	1190±5.19 (3464)	1.90
PB-2		
S-46	1152±5.54 (1452)	1.89
S-47	1094±5.64 (3270)	1.88
Control		
2021-22	968.4±8.19 (192)	1.90
2022-23	887.6±10.23 (413)	1.91

Frequency distribution of 5 weeks body weight

Frequency distribution of 5 weeks body weight (frequency on Y axis and body weight on X axis) (Fig 1). In PB-1 the body weight at 5 weeks ranged from 200 to 2000 g. Similarly, in PB-2 range was from 100 to 2000 g.

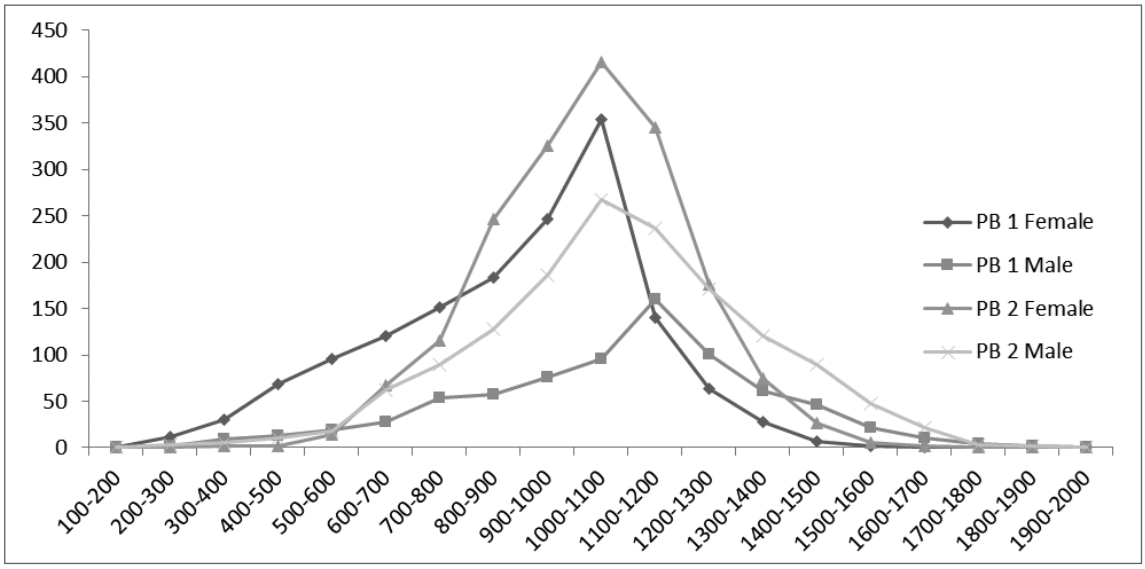


Fig 1. Frequency distribution of 5 wks BW in PB-1 male and female lines and PB-2 male and female lines.

Production traits

The production traits were recorded up to 52 weeks of age in PB-1, PB-2 and control lines. The body weight of PB-1 and PB-2 lines at 20 weeks of age (Table 6) was higher than the optimum body weight, which with proper feed restriction schedule needs to be maintained between 2150-2200 g for realizing the optimum production during laying phase.

The age at sexual maturity decreased in PB-1 and PB-2 lines as compared to previous generation (Table 7). The egg weight at 40 weeks of age was 54.96, 53.54 and 55.92 g, respectively in PB-1, PB-2 and control lines. Egg weights slightly increased in PB-1 and PB-2 lines. There was increase in the egg production up to 40 weeks and 52 weeks of age in PB-1, PB-2 and control lines as compared to last generation (Table 8).

Table 6. Adult body weight in PB-2, PB-1 and control lines

Gen./ year	Body weight (g)	
	20 wks	40 wks
PB-1		
S-14	2385±10.14 (456)	3096±6.86 (415)
S-15	**2371±11.51 (692)**	**3083±9.12 (484)**
PB-2		
S-46	2299±14.15 (428)	3013±2.95 (421)
S-47	**2296±16.78 (560)**	**2935±13.17 (422)**
Control		
2021-22	2211±8.88 (115)	2946±12.56 (115)
2022-23	**2328±13.58 (168)**	**2878±5.53 (154)**

Table 7. ASM and egg weights performance at different ages

Gen./ year	ASM (d)	Egg weight (g)	
		40 wks	52 wks
PB-1			
S-14	176.0±1.13 (456)	55.07±0.17 (250)	64.51±1.26 (221)
S-15	**177.23±1.08 (688)**	**54.96±0.62 (477)**	**64.03±0.12 (341)**
PB-2			
S-46	173.7±1.66 (428)	56.09±0.31 (254)	65.66±10.1 (185)
S-47	**171.81±1.86 (558)**	**53.54±0.42 (407)**	**63.77±3.44 (298)**
Control			
2021-22	179.1±18.1 (157)	54.26±0.65 (102)	62.73±8.09 (98)
2022-23	**174.22±4.43 (168)**	**55.92±0.67 (154)**	**NC**

Table 8. Egg production performance at 40 and 52 weeks of age

Gen./ year	Egg production (Nos.)	
	40 wks	52 wks
PB-1		
S-14	55.02±0.99 (422)	115.6±1.26 (285)
S-15	**65.14±1.68 (477)**	**117.11±1.62 (350)**
PB-2		
S-46	56.13±5.56 (415)	118.3±10.4 (265)
S-47	**70.63±1.19 (418)**	**121.34±2.04 (311)**
Control		
2021-22	51.22±6.33 (110)	100.6±9.84 (105)
2022-23	**59.82±2.51 (154)**	**NC**

Egg quality traits

The egg quality traits measured at 36 weeks of age in PB-1, PB-2 and control lines were presented in Table 9.

Genetic parameters

The heritability estimates for five weeks body weight, BW20, ASM and 40 weeks egg production in PB-2 line were 0.13, 0.15, 0.11 and 0.14, respectively based on the half sib analysis.

Genetic and phenotypic response

The genetic and phenotypic response over the generations in PB-1 and PB-2 is presented in Fig 2, 3, 4 and 5. The phenotypic and genetic response was 0.59 and 4.42 g for 5 weeks body weight and -1.72 eggs and -0.29 eggs for 40 weeks egg production, respectively in PB-2 population over last 16 generations. The phenotypic and genetic response for 5 weeks body weight was 7.36 and 11.17 g, respectively in PB-1 over last 16 generations. The phenotypic response of egg production up to 40 weeks of age was -0.83 eggs and genetic response was 0.61 egg over 15 generations.

Table 9. Mean and SE for egg quality traits at 36 weeks of age (n=30)

Egg quality traits	Strains		
	PB-1	PB-2	Control
Egg weight (g)	55.07±0.17	56.09±0.31	54.26±0.65
Egg length (cm)	5.60±0.14	5.71±0.23	5.32±0.05
Egg width (cm)	4.64±0.05	4.37±0.26	4.24±0.09
Shape index	82.86±0.39	76.56±0.47	79.70±0.49
Shell thickness (mm)	37.41±0.26	37.51±0.36	38.01 ±0.43
Albumen height (mm)	8.16±0.45	8.34±0.23	8.04±0.21
Yolk height (mm)	16.43±0.23	16.47±0.21	16.69±0.19
Yolk diameter (mm)	3.78±0.16	3.90±0.16	3.84±0.18
Yolk index	4.35	4.22	4.35
Haugh unit[2]	91.17	92.12	90.53

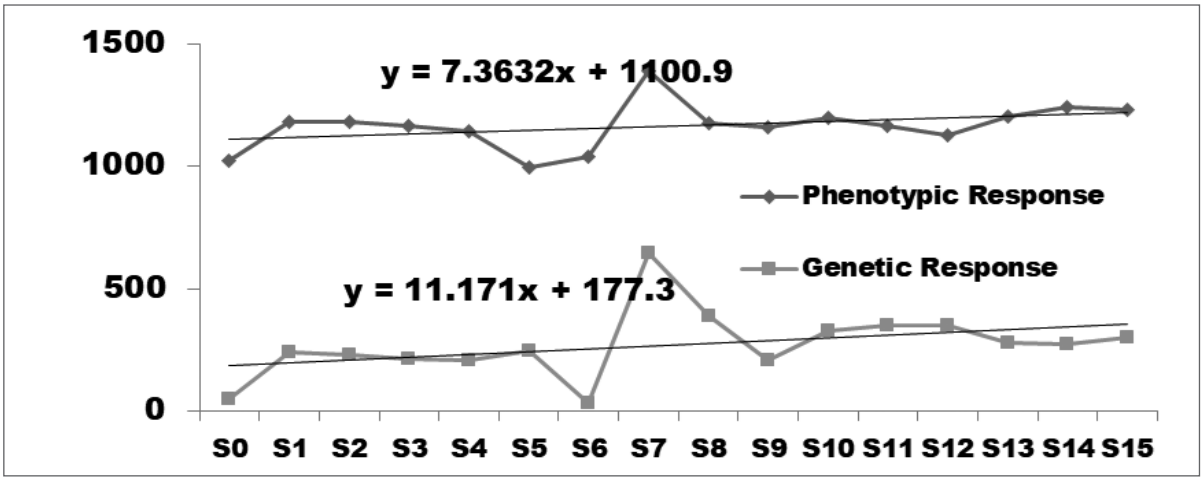


Fig 2. Genetic and phenotypic response to 5 week body weight in PB-1 at Ludhiana

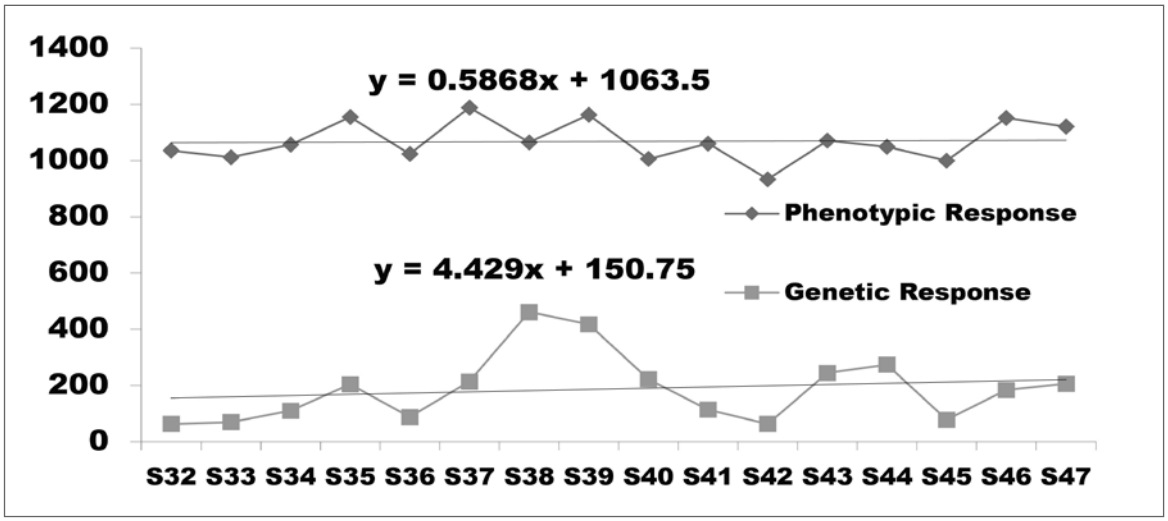


Fig 3. Genetic and phenotypic response to 5 week body weight in PB-2 at Ludhiana

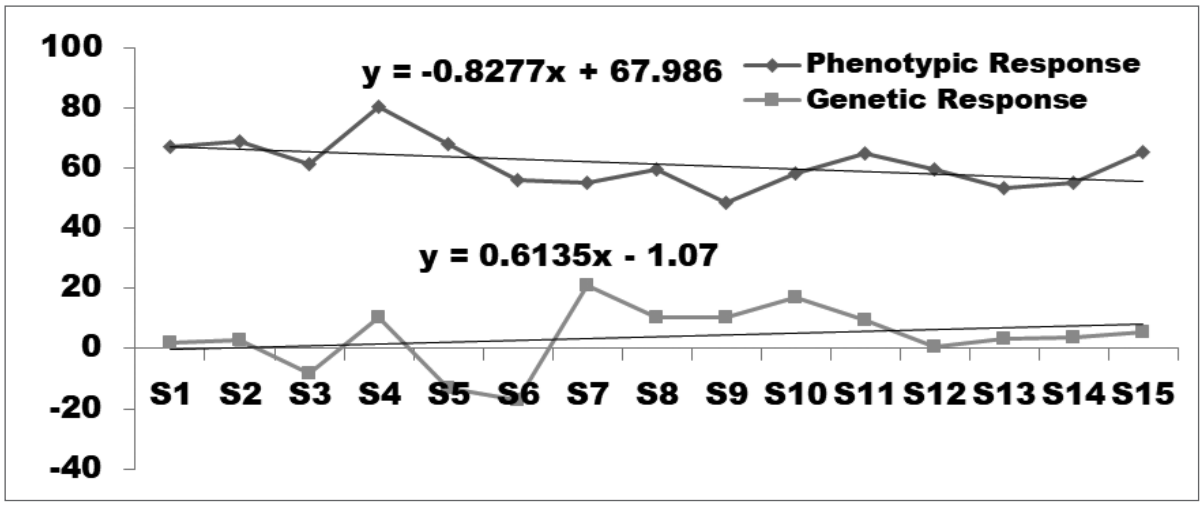


Fig 4. Genetic and phenotypic response to EP 40 wks in PB-1 at Ludhiana

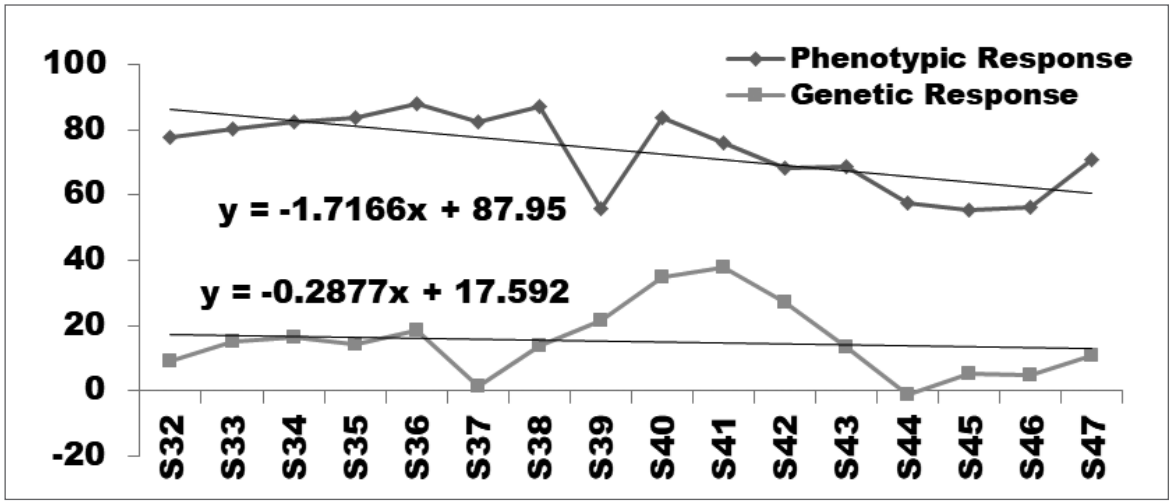


Fig 4. Genetic and phenotypic response to EP 40 wks in PB-1 at Ludhiana

Evaluation of IBL-80

A total of 75 day old chicks of IBL-80 (PB-1x PB-2) birds were reared on intensive farming. The net profit was Rs.38.89 per bird.

Average body weight (g) per bird	: 1,658
Total feed consumed per bird (g)	: 3125
Cost of feed @ Rs.30 per Kg	: 92.75
Receipts (sold at Rs.80/kg live wt.	: 132.64
Profit per bird (Rs.)	: 38.89

Participation in RSBPT for broilers

The centre Participated in the 55th Random sample broiler performance test (RSBPT) at CPPTC Gurgaon commenced on 1st September, 2022. Live body weight at 7th week was 1.628 Kg and FCR at 7th week was 2.114 in IBL-80 (PB-1x PB-2). Centre achieved 4th rank on the basis of body weight and 3rd rank on FCR basis among eight (8) participating organizations.

Implementation of DAPSC component

A total of 12 SC beneficiaries were provided with 4-weeks old chicks. The feedback is being collected and farmers have sold the birds at Rs. 500 to 750 rupees after rearing them for a month at their backyards. One 3-day training and one 2-day training were conducted for 20-20 SC beneficiaries.

Germplasm supply

A total of 87,364 Nos. germplasm were distributed to 363 farmers.

Revenue generation

The centre generated the revenue of Rs. 29.11 lakhs which was 116 % of expenditure on feed (Rs. 25.00 lakhs).

Odisha University of Agriculture and Technology, Bhubaneswar (Odisha)

Activities assigned

- Evaluation of local native chicken (*Hansli*) germplasm.
- Establishment and evaluation of CSFL and CSML populations for economic traits.
- To evaluate the control population along with CSFL and CSML populations.

Action taken

Hansli chicken was evaluated for juvenile and production traits in S-1 generation.

G-1 generation of CSML and CSFL were evalaued for juvenile and production traits.

Achievements

Evaluation of *Hansli* breed of chicken

A total of 182 good chicks of S-1 generation of *Hansli* chicken were hatched. Fertility was 74.6% and hatchability on total and fertile egg set basis was 61.7 and 82.7%, respectively. The average body weight at day old was 31.08 g. Body weight at 8 and 20 weeks of age was 603.2 and 1583 g, respectively. There is an improvement in body weights as compared to previous generation. Mortality during 0-8, 9-20 and 21-40 weeks were 4.12, 2.02 and 3.46%, respectively (Table 1).

The average age at sexual maturity was 173 days. The hen day egg production at 40 and 52 weeks of age were 25.22 and 34.36 eggs. The average egg weight at 40 weeks of age was 44.12g.

Conservation and utilization of elite germplasm

Establishment of CMSL and CSFL lines

The centre has evaluated the G-1 generation of CSML and CSFL lines.

Mortality

The mortality during 0-5 weeks in CSFL and CSML was 4.09 and 4.23 %, respectively (Table 2). During grower period mortality of 4.89 and 5.03% was recorded in CSFL and CSML lines, respectively.

Table 1. Performance of *Hansli*

Traits	S-0	S-1
Body weight (g)		
Day old	30.22± 0.28 (161)	31.08±0.04 (182)
8 wks	449.6± 9.75 (72)	603.2±7.68 (75)
20 wks	1535±22.2 (61)	1583±21.65 (83)
FCR (8 wks)	4.49	4.26
Body conformation traits		
Breast Angle (°)	43.09±0.37	43.44±0.87
Shank Length (cm)	7.47±0.08	7.32±0.04
Keel Length (cm)	7.12±0.05	6.88±0.05
Mortality (%)		
0-8 wks	4.36	4.12
9-20 wks	2.11	2.02
21-40 wks	3.53	3.46
Production traits		
ASM (days)	175	173
Egg weight at, g		
32 wks	40.22±0.19	41.23±0.33
40 wks	43.99±0.48	44.12±0.41
52 wks	47.22±0.74	47.50±0.76
Egg production (HD)(Nos)		
40 wks	24.51	25.22
52 wks	33.69	34.36

Table 2. Mortality percentage at different ages

Gen.	Mortality (%)		
	0-5 wks	6-20 wks	21-40 wks
CSFL			
G-1	4.09	4.89	3.08
CSML			
G-2	4.23	5.03	3.78

Body weight

During current generation the average body weight at 5 weeks of age was 1018 and 1123 g in CSFL and CSML, respectively (Table 3). The feed efficiency up to 5 weeks of age was 1.94 and 1.93 in CSFL and CSML lines.

Production traits

The body weight at 20 weeks of age in CSFL and CSML are well within the recommended limit (Table 4). The ASM of current generation in CSFL was 179 and in CSML was 181 days.

Table 3. Body weight (g) and conformation traits in CSFL and CSML

Gen.	BW5 (g)	FCR	BA (°)	SL (mm)	KL (mm)
CSFL					
G-1	1018±5.97 (562)	1.94	52.11±0.17 (562)	81.34±0.29 (562)	85.15±0.22 (562)
CSML					
G-1	1123±6.08 (566)	1.93	51.31±0.20 (566)	80.15±0.33 (566)	85.66±0.24 (566)

Table 4. ASM and body weight (g) at 20 and 40 weeks in CSFL and CSML

Generation	ASM (d)	20 wk BW (g)	40 wk BW (g)
CSFL			
G-1	179	2313±11.09 (300)	2944±34.77 (300)
CSML			
G-1	181	2434±23.52 (300)	3243±23.59 (300)

Egg production and egg weight

Egg weight at 40 weeks of age was 55.97 g in CSFL and 55.19 g in CSML (Table 5).

Table 5. Egg weight and egg production in CSFL and CSML lines

Gen.	EW 32 (g)	EW 40 (g)	40 wks HDEP	52 wks HDEP
CSFL				
G-1	52.33±0.26	55.97±0.69	64.31	111.45
CSML				
G-1	53.25±0.30	55.19±0.75	61.55	107.24

Egg quality

The egg quality traits at 52 weeks of age are presented in Table 6.

Table 6. Egg quality traits at 52 weeks of CSFL and CSML

Egg quality traits	CSFL	CSML
	G-1	G-1
Egg Weight (g)	58.23±0.65	58.01±0.48
Shape index (%)	74.88±0.34	72.22±0.38
Shell Thickness (mm)	0.331±0.03	0.423±0.04
Albumen Index	0.069±0.005	0.081±0.005
Yolk Index	0.430±0.00 4	0.475±0.002
Haugh Unit	73.88±2.19	79.27±1.42

Three types of native chickens namely Nusuri, Vezaguda and Phulbani chickens were identified by surveying. The native tract of Nusuri is the Mayurbhanj district of Odisha. Malkangiri and Koraput districts of Odisha are the native tracts of Venaguda. The Phulbani chicken is originated from Kandhamal and Boudh districts of Odisha. The morphological characteristics, growth and production performance of these three types of native chickens are documented under the AICRP on Poultry Breeding project.

Implementation of DAPSC component

A total of 6 trainings were conducted. About 3000 chicks, feed and equipment were distributed to 300 beneficiaries.

Germplasm supply

The centre supplied 7,827 numbers of germplasms to farmers (371 numbers).

Revenue generation

Revenue to the tune of Rs. 1.40 lakhs have been generated by the centre which was 47% of feed cost (Rs 2.97 lakhs).

ICAR- Central Avian Research Institute, Izatnagar (Uttar Pradesh)

Activities assigned

- Evaluation of local native chicken germplasm and developing crosses.
- To improve and evaluate CSML and CSFL lines.
- To maintain a control population simultaneously to measure the genetic trends.

Action taken

- Regenerated and evaluated local native chicken line.
- Regenerated and evaluated the 20th generation of CSML and CSFL lines.
- Production and evaluation of CSML x local native cross.

Achievements

Evaluation of native germplasm

The S-7 generation of the native chicks (Desi) was evaluated for growth and conformatory traits. Mass Selection for higher 16 weeks body weight and mild culling based on egg production in 40 weeks was practiced in local native chicken. A total of 998 good chicks were hatched in S-7 pedigreed generation with fertility, hatchability on TES and on FES of 78.43, 67.48 and 86.04%, respectively. There is reduction in fertility and hatchability performance as compared to previous generation. The growth performance and egg production performance of native germplasm was not provided.

Evaluation of CSML x local native cross at farm

A total of 1130 good chicks of CSML x local native was obtained with fertility of 85.62% and hatchability on TES and FES of 71.99 and 84.08%, respectively. An experiment was conducted to find the crucial role of dietary energy and protein levels in influencing the performance of the cross. The body weight at 12 weeks of age ranged from 1,635 to 1,851g in different energy x protein interaction treatment groups. FCR up to 12 weeks (finisher) for the treatment groups was ranged from 3.35 to 3.99. Body conformation traits such as shank length, keel length and breast angle at 12 weeks of age were also recorded.

Conservation and utilization of elite germplasm

Selection records

The CSML and CSFL lines has reached 20th generation of selection based on body weight at 5 weeks of age. S-20 generation was regenerated using 52 sires and 312 dams in CSML, 52 sires and 312 dams in CSFL and 50 sires and 150 dams in Control lines.

Incubation records

The incubation records for the CSML, CSFL and the control lines over last two generations were presented in Table 1. A total of 3936, 3508 and 791 eggs were set in CSML, CSFL and control lines and out of which 2205, 2257 and 651 good chicks were obtained. There is reduction in hatchability (TES & FES) in both CSML and CSFL lines as compared to previous generation.

Table 1. Summary of incubation and hatching results during last two generations

Gen.	Eggs set (Nos.)	Fertility (%)	Good Chicks (Nos.)	Hatchability (%)	
				TES	FES
CSML					
S-19	4926	72.39	3163	64.84	89.57
S-20	3936	78.35	2205	57.11	72.89
CSFL					
S-19	5434	72.91	3518	65.61	89.98
S-20	3508	81.04	2257	65.51	80.83
Control					
S-19	1053	72.52	795	76.54	91.59
S-20	791	93.17	651	85.57	90.05

Mortality

The mortality details in broiler line at different age groups were not given.

Body weights

The body weight at 5 weeks of age recorded in CSML, CSFL and control lines over last two generations is presented in Table 2. The body weight at 5 weeks of age in CSML, CSFL and control lines recorded in the year 2022-23 (S-20) were 1257, 1242 and 669.8 g, respectively. The body at 5 weeks increased in CSFL and decreased in CSML and Control lines as compared to previous generation. Number of observations were not given.

Table 2. Body weight at 5 weeks during the last two generations

Gen.	Body wt. 5 wks (g)
CSML	
S-19	1243±3.11
S-20	**1257±6.56**
CSFL	
S-19	1262±3.17
S-20	**1242±5.15**
Control line	
S-19	838.9±8.97
S-20	**669.8±4.06**

Production performance

The production traits such as ASM, body weight at 20 weeks and 40 weeks were 188.4 days, 2469 and 3695 g in CSML and 185.3 days, 2406 and 3517g in CSFL lines, respectively in S-19 generation. Corresponding performance in control line was 178.5 days, 2304 and 3209 g, respectively. The hen housed egg production up to 40 weeks in CSML, CSFL and control lines was 67.18, 68.40 and 56.50 eggs, respectively during S-19 generation. Details of egg weights at 40 weeks of age were nor provided.

Response

Phonotypic and genetic response in CSML and CSFL for body weight at 5 weeks was presented in Fig-11 and 12. The phenotypic response per generation was 10.23 and 7.89 g in CSML and CSFL, respectively over last 16 generations. The genetic response was 12.28 and 12.84 g, respectively, in CSML and CSFL lines in last 16 generations.

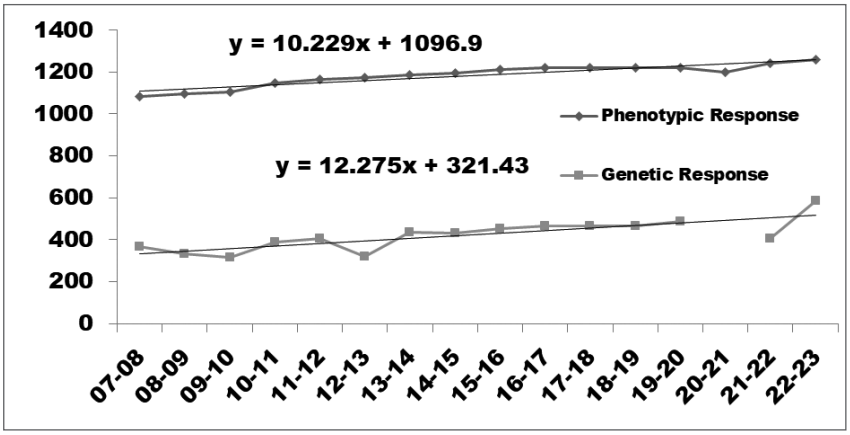


Fig 11. Genetic and phenotypic response to 5 wk body weight in CSML at Izatnagar

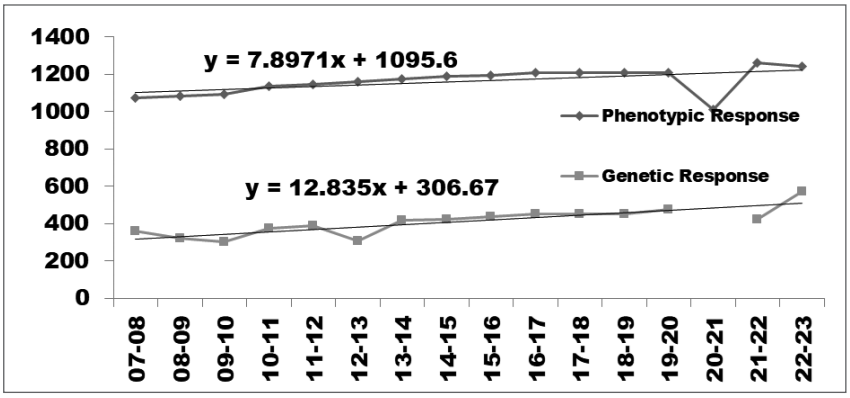


Fig 12. Genetic and phenotypic response to 5 wk body weight in CSFL at Izatnagar

Participation in RSBPT for broilers

Participated in 55th Random sample broiler test performed for commercial stock at Central Poultry Performance Test (CPPTC) Gurugram, Haryana and CARIBRODHANRAJA secured 2nd rank by attaining 1.9 kg body weight and 2.1 FCR at 7 weeks of age with a dressing percentage of 70.67%.

Germplasm supply

A total 16,138 germplasm (7426 fertile eggs, 8212 day old chicks and 500 grownup birds) were supplied to the 23 farmers and other stakeholders across 6 states. A total of 4560 germplasm was supplied to ICAR-IVRI and ICAR-CARI for research purpose.

Revenue generation

The centre generated the revenue of Rs. 17.69 lakhs during the year.

CSK Himachal Pradesh Krishi Vishwavidyalaya, Palampur (Himachal Pradesh)

Activities assigned

- Collection and evaluation of the local native chicken.
- Procurement and evaluation of improved chicken germplasm in the local climatic condition.
- Production and evaluation of crosses of local native birds with improved germplasm.
- The center will work on development of new varieties suitable for rural poultry in the region utilizing local native germplasm.

Action taken

- *Himsamridhi,* a location specific variety suitable for backyard poultry farming in hilly areas is being propagated and evaluated under farm and field conditions
- In native chickens, G-10 generation was evaluated up to 40 weeks of age, while G-9 generation from the previous year completed evaluation from 41 weeks to 72 weeks of age. New native germplasm (43 females and 6 males) was also procured from different regions of state.
- The *Dahlem Red* population (G-9) evaluated up to 52 weeks of age, while G-8 generation completed evaluation from 41 weeks to 52 weeks of age
- The *Dahlem Red* X Native (DN) cross was produced and evaluated up to 52 weeks of age.

Achievements

Native chickens

A total of 6,856 chicks of native germplasm were produced at hatchery. A total number of 15 sires and 125 dams of G-9 Native generation was used for producing pedigreed population of G-10 generation using mating pens. Half sib heritability estimates in native population for body weight at 8 weeks, 12 week and 20 weeks of age were 0.13±0.07, 0.20±0.05 and 0.26±0.06 respectively.

Dahlem Red

New parental stock of DR (850 Female +150 males) was procured from ICAR-DPR, Hyderabad and evaluated as new generation G-1 in 2022-23 up to 52 weeks of age. The G-8 generation of *Dahlem Red* maintained in 2021-22 was evaluated from 41-52 weeks of age and was not used for the regeneration.

Incubation records

The summary of incubation records for various pure lines and crosses is presented in Table 1. The fertility is comparable to the previous year and ranged from 84.64% for *Dahlem Red* to 90.97% for native chickens. Hatchability however slightly declined and ranged from 67.30 to 73.87% as compared to previous year (71.72 to 77.99%) on TES basis. Over all fertility and hatchability was good.

Table 1. Summary of incubation and hatching

Strain/ cross	Year	Eggs set (Nos.)	Fertility (%)	Hatchability (%)		Good chicks (Nos.)
				TES	FES	
Native	2021-22	8399	84.01	71.72	85.37	6024
	2022-23	**9344**	**90.97**	**73.37**	**80.64**	**6856**
Dahlem Red	2021-22	8187	92.43	77.75	84.11	6366
	2022-23	**10234**	**84.64**	**67.30**	**79.52**	**6888**
DN cross	2021-22	3359	91.81	77.99	84.98	2620
	2022-23	**4285**	**90.17**	**70.57**	**78.26**	**3024**
Himsamridhi (DND) cross	2021-22	78201	87.54	73.68	84.18	57624
	2022-23	**63790**	**88.83**	**73.87**	**83.15**	**47124**

Mortality

The chick mortality (0-6 weeks) ranged from 0.88 to 5.40% (Table 2) during this year. The chick stage mortality reduced in comparison to previous year for *Himsamridhi* and native chickens. The mortality during 7-20-weeks of age ranged from 2.02 to 3.53%. The grower stage mortality is reduced in comparison to previous year in native and *Himsamridhi***.** Mortality during 21-40 weeks period ranged from 0.57 to 4.18%. Non-specific causes like chilling, overcrowding / huddling and killing by rodents are among important causes of mortality. Further the centre is also taking necessary precautions to reduce the mortality by including bio-security measures.

Evaluation of Native chicken and *Dahlem Red*

The performance of native chickens and *Dahlem Red* was evaluated (Table 3). In native chickens (G-10) body weights at different ages were more or less similar to previous generation (G-9). Age at first egg of native chicken population was comparable to previous generation. Egg weight of native chickens (G-10) improved slightly over previous generation (G-9). For Native (G-10) egg production up to 40 weeks of age was comparable to previous generation (G-9). The new parental stock (G-1) of *Dahlem Red* was evaluated up to 52 weeks, while the G-8 was evaluated from 41 to 52 weeks of age.

Table 2. Incidence of mortality at different ages

Strain/ cross	Year	Mortality (%)		
		0-6 wks	7-20 wks	21-40 wks
Dahlem Red	2021-22	4.30	2.42	2.83
	2022-23	**5.40**	**2.95**	**3.40**
Native	2021-22	0.98	2.74	2.11
	2022-23	**0.88**	**2.67**	**4.18**
DN cross	2021-22	3.40	3.30	1.63
	2022-23	**4.39**	**3.53**	**2.55**
DNxD cross/ *Himsamridhi*	2021-22	6.35	2.26	2.06
	2022-23	**4.41**	**2.02**	**0.57**

Table 3. Performance of Native and *Dahlem Red* chickens

Traits	Native				*Dahlem Red*			
	2022-23 (G-10)		2021-22 (G-9) *		2022-23 (G-1)		2021-22 (G-8) *	
	N	Mean ±SE	N	Mean ± SE	N	Mean ±SE	N	Mean ±SE
Body weight (g) Pooled sex								
Day old	340	30.25±0.05	289	30.15±0.10	1000	33.10±0.50	1877	36.50±0.10
4 wks	340	198.7±3.84	264	180.3±3.09	957	280.1±4.35	1783	220.7±2.20
8 wks	334	525.8±12.25	246	550.2±21.9	929	575.1±9.10	1725	510.6±5.40
20 wks	157	1395±26.20	229	1370±12.8	670	1580±11.6	1680	1550±13.5
40 wks	150	1545±20.20	178	1520±24.00	652	1750±10.2	705	1685±12.3
FCR (0-8 wks)	334	4.77	246	4.58	929	4.38	1725	4.43
AFE (d)	157	152	125	150	670	138	1680	137
ASM (d)	157	178	125	182	670	167	1660	162
Egg weight (g)								
28 wks	50	42.10±0.10	100	40.85±0.10	100	49.67±0.24	100	49.01±0.10
40 wks	50	46.15±0.20	100	45.75±0.13	100	52.40±0.26	100	52.10±0.25
52 wks	50	49.24±0.15	50	48.10±0.10	100	55.33±0.10	100	54.05±0.15

Traits	Native				*Dahlem Red*			
	2022-23 (G-10)		2021-22 (G-9) *		2022-23 (G-1)		2021-22 (G-8) *	
	N	Mean ±SE	N	Mean ± SE	N	Mean ±SE	N	Mean ±SE
EP 40 wks (Nos.)								
Hen housed	157	47.33	121	46.09	665	82.24	705	78.70
Hen day	153	48.56	118	47.26	652	83.88	688	80.65
Survivors	150	49.53	112	49.79	640	85.45	662	83.81
EP 52 wks (Nos.)								
Hen housed		Under evaluation	**121**	**71.20**	665	131.6	**705**	**132.77**
Hen day			**114**	**75.57**	605	144.2	**665**	**140.75**
Survivors			**109**	**78.80**	580	150.4	**650**	**143.99**
EP 72 wks (Nos.)								
Hen housed		Under evaluation	**121**	**111.70**		Under evaluation	Culled	
Hen day			**112**	**120.67**				
Survivors			**104**	**129.95**				

* G-9 generation of native chickens was evaluated from 41 to 72 weeks during 2022-23 and G-8 generation of *Dahlem Red* was evaluated from 41 to 52 weeks during 2022-23

Evaluation of DN cross

The performance of DN cross (*Dahlem Red* x Native) was outlined in Table 4. The DN cross completed evaluation up to 52 weeks of age. Body weights and egg weights at different ages were comparable to the previous evaluation. There is a slight reduction in the egg production at 40 and 52 weeks of age compared to previous evaluation.

Evaluation of *Himsamridhi*

The DND cross (*Himsamridhi*) was evaluated under farm (Table 4) and field conditions (Table 5) up to 72 weeks in previous and up to 52 weeks of age during present evaluation. There is improvement in body weight up to 20 weeks of age compared to previous evaluation, however 40 weeks body weight showed slight reduction. Egg weight at 28 and 52 weeks of age also slightly higher compared to previous evaluation. Egg production at 40 and 52 weeks of age reduced slightly compared to previous evaluation. Egg production under field evaluation from previous year completed 40 weeks onwards evaluation during current year with egg production of 93.30/hen and 151.70 eggs/hen at 52 weeks and 72 weeks of age respectively.

Implementation of STC Component

Under the Schedule Tribe Component (STC) 6,550 chicks were supplied free of cost to 131 farmers along with starter feed of 50 kg/unit, feeder, drinkers and medicine and 8 On Farm Trials (OFT) were conducted in collaboration with different KVKs and NGOs. Five training programs were organized covering 120 farmers in collaboration with KVKs/NGO for tribal farmers of Kangra, Chamba and Kinnaur regions. While 11 one day awareness programs were conducted covering 180 farmers. Survey was also done in tribal areas to identify more poultry farmers for establishment of more poultry units in coming years.

Germplasm supply

During the year, the centre supplied 60,149 chicks/growers of *Himsamridhi* (DND cross), Native and other crosses to 661 farmers including 131 farmers under TSP component

Revenue generation

The centre realised receipts of Rs 27.32 lakhs during the financial year on account of sale of various poultry products (chicks, eggs, culled birds) which is 90.92% of expenditure on feed cost (Rs 30.05 lakhs).

Table 4. Growth and production performance of crosses

Traits	DN cross				DND cross (*Himsamridhi*)			
	2022-23		2021-22		2022-23		2021-22*	
	N	Mean ±SE	N	Mean±SE	N	Mean ±SE	N	Mean±SE
Body weight (g) Pooled sex								
Day old	296	30.15±0.15	232	34.20±0.25	300	32.10±0.10	250	33.95±0.20
4 wks	284	220.6±5.10	232	210.5±3.16	261	230.1±4.20	250	198.5±1.74
8 wks	276	485.3±13.2	226	456.3±7.80	230	550.2±8.10	234	421.2±5.80
20 wks	107	1426±15.2	96	1450±14.2	88	1490±13.20	172	1480±11.60
40 wks	92	1585±20.6	91	1610±20.6	82	1556±14.25	115	1595±21.65
FCR (0-8 wks)	276	4.80	226	5.52	230	4.58	250	33.95±0.20
AFE (d)	107	150	96	138	82	152	115	132
ASM (d)	107	171	96	179	80	169	112	174
Egg weight (g)								
28 wks	50	46.10±0.20	50	45.20±0.25	50	49.32±0.35	50	46.55±0.10
40 wks	50	50.85±0.60	50	50.10±0.50	50	51.90±0.20	50	51.95±0.28
52 wks		52.10±0.25	50	52.65±0.10	50	54.01±0.10	50	53.70±0.10
EP 40 wks (Nos.)								
Hen housed	107	62.32	96	66.31	88	70.05	115	72.84
Hen day	99	67.36	93	68.04	85	72.53	112	74.79
Survivors'	92	72.48	91	69.95	82	75.18	108	77.56
EP 52 wks (Nos.)								
Hen housed	107	102.50	96	106.96	88	113.92	**115**	**115.85**
Hen day	101	108.65	92	111.60	84	119.34	**110**	**121.11**
Survivors'	92	119.22	88	116.69	82	122.26	**104**	**128.10**
EP 72 wks (Nos.)								
Hen housed	Under evaluation		96	118.57		Under evaluation	**115**	**144.06**
Hen day			89	126.61			96	**172.92**
Survivors'								

DN cross of 2021-22 evaluated from 53 to 72 weeks during current year and Himsamridhi (DND cross) of 2021-22 was evaluated from 41 to 72 weeks of age during current year

Table 5. Performance of DND (*Himsamridhi*) cross at farmer's flocks

Traits	2022-23 (E-8)		2021-22 (E7) *	
	N	Mean ±SE	N	Mean ± SE
Body weight (g)				
4 wks	600	208.3±3.20	670	195.3±3.48
8 wks	480	481.3±2.76	518	403.8±4.39
20 wks Male	100	1720 ± 9.6	80	1558±19.1
20 wks Female	200	1405±9.49	190	1388±23.6
40 wks Male	20	2281±35.7	20	2150±34.9
40 wks Female	160	1541± 11.7	170	1490±21.6
ASM (days)		210	190	210
Egg weight (g)				
28 wks	100	44.90±0.23	100	45.10±0.36
40 wks	100	49.69±0.38	100	49.55±0.47
EP (Nos.)				
40 wks	160	52.59	170	55.60
52 wks	135	95.73	150	**93.30**
72 wks	Under evaluation		130	151.7

*Evaluated from 41 to 72 weeks in 2022-23

Maharana Pratap University of Agriculture & Technology, Udaipur (Rajasthan)

Activities assigned

- Evaluation and improvement of the local native chicken germplasm.
- Procurement and evaluation of improved chicken germplasm in the local climatic condition
- Evaluation of *Pratapdhan* in different agro-climatic conditions.

Action taken

- G-12 generation of *Mewari* breed was evaluated up to 52 weeks of age.
- *Pratapdhan* was evaluated for production traits up to 72 weeks of age during E11 generation.
- RIR and CSFL populations were regenerated and being maintained at the centre
- Germplasm of *Pratapdhan*, a dual-purpose variety was supplied to the needy farmers.

Achievements

Incubation records

The centre regenerated G-13 generation of *Mewari* chicken population as well as RIR, CSFL, BN and BNR populations. The fertility improved in all the populations (except BN) as compared to previous generation. The hatchability on total as well as on fertile eggs set improved in all the populations in the present generation as compared to previous generation, except hatchability on fertile egg set in *Mewari*. (Table 1).

Table 1. Summary of incubation and hatching results of different populations

Strain / breed/cross	Year	Eggs set (Nos.)	Fertility (%)	Hatchability (%)		Good Chicks (Nos.)
				TES	FES	
Mewari	G-11	2826	81.43	64.78	79.55	1837
	G-12	2842	80.55	68.33	85.07	1964
	G-13	**5284**	**83.87**	**69.63**	**82.79**	**3679**
RIR	2020-21 (G-10)	6300	82.90	69.16	83.20	4357
	2021-22	-	-	-	-	4000
	2022-23	**6605**	**85.84**	**74.07**	**86.28**	**4892**
CSFL	2020-21 (G-10)	810	87.77	72.23	82.28	617
	2021-22	478	90.59	79.08	87.30	378
	2022-23	**510**	**94.90**	**87.25**	**91.94**	**445**
BN cross	2020-21	1936	84.20	67.40	80.18	1310
	2021-22	2309	84.27	68.75	81.66	1583
	2022-23	**2149**	**82.83**	**72.78**	**87.87**	**1564**
Pratapdhan (BNR)	2020-21	30511	84.25	67.93	80.55	21027
	2021-22	19614	81.13	70.23	86.62	13872
	2022-23	**34486**	**85.28**	**73.40**	**86.15**	**25313**

Performance evaluation of germplasm

In *Mewari* population, the juvenile body weights at 8 weeks slightly increased during G-12 generation. Similarly, body weight recorded at 16 weeks of age on pooled sex was slightly lower as compared to the previous generation. The body weight of females at 20 and 40 weeks of age was slightly lower as compared to G-11 generation. The age at sexual maturity was similar to the previous (G-11) generation. The hen housed, hen day and survivors 'egg production up to 40 and 52 weeks of age have improved as compared to previous generation (Table 2).

Evaluation of *Pratapdhan*

E-11 generation of *Pratapdhan* was evaluated up to 72 weeks of age (Table 3). The pooled body weights at different ages improved slightly as compared to the previous evaluation. Similarly, the body weight of females at 20 weeks of age was also higher as compared to the previous evaluation. The hen housed and hen day egg production up to 40, 52 and 72 weeks of age increased as compared to the previous evaluation except hen day egg production at 52 weeks of age.

Table 2. Growth and production performance of *Mewari*

Traits	*Mewari* (G-12)		*Mewari* (G-11)	
	N	Mean±SE	N	Mean±SE
Body weight, pooled sex (g)				
day old	1834	32.36±0.07	2249	32.03±0.15
8 wks	1226	640.8±3.8	1091	630.1±2.6
16 wks	806	984.2±4.73	793	991.8±8.29
20 wks*	415	1414±7.58	429	1426±11.01
40 wks*	270	1680±13.96	283	1743±13.47
ASM (d)	176	166.1±2.19	169	165.8±2.19
Egg weight (g)				
28 wks	369	42.82±0.22	308	42.88±0.31
40 wks	223	46.09±0.32	232	45.92±0.36
EP 40 wks (Nos.)				
Hen housed	359	36.71±0.37	313	34.60±0.39
Hen day		37.69±0.32		35.74
Survivors'	344	38.31±0.35	295	36.71±0.39
EP 52 wks (Nos.)				
Hen housed	359	50.33±0.42	313	48.49±0.51
Hen day		53.13		52.46
Survivors'	334	54.10±0.38	281	54.01±0.44
EP 72 wks (Nos.)				
Hen housed	-	-	**313**	**87.36±0.48**
Hen day	-	-		**101.13**
Survivors'	-	-	**249**	**109.8±0.52**

*Values for females only from 20 weeks onwards

Table 3. Growth and production performance of *Pratapdhan* during different evaluations

Pratapdhan						
Traits	N	E-11	N	E-10	N	E-9
Body weight (g)						
day old	425	39.12±0.13	456	39.01±0.17	400	39.18±0.20
2 wks	419	155.6±1.07	424	145.2±3.49	390	142.8±1.88
4 wks	413	329.8±3.45	308	268.5±3.06	381	277.8±2.82
8 wks	235	816.1±10.4	271	750.5±0.46	370	866.8±7.4
20 wks*	120	2019±14.9	191	1950±17.2	293	2155±24.4
AFE in the flock (d)		143		140	-	146
ASM (d)	159	161.4±0.86	151	159.3±0.67	139	157.6±0.64
Egg weight (g)						
28 wks	253	46.63±0.33	252	46.88±0.34	210	46.44±0.34
40 wks	215	53.18±0.23	192	53.10±0.40	208	52.39±0.25
EP 40 wks (Nos.)						
Hen housed	120	51.57±0.86	124	49.66±0.85	130	50.26± 0.56
Hen day	-	53.90		53.01	-	52.3
Survivors'	112	55.25±0.73	110	55.98±0.82	121	54.09± 0.47
EP 52 wks (Nos.)						
Hen housed	120	82.49±0.82	124	82.19±0.82	130	83.25± 0.56
Hen day	-	91.92		92.86	-	90.9
Survivors'	105	94.3±0.70	101	100.9±0.79	107	101.1± 0.67
EP 72 wks (Nos.)						
Hen housed	120	145.7±0.69	124	131.9±0.69	130	127.7± 0.59
Hen day	-	162.5		160.2	-	158.2
Survivors'	97	180.2±0.65	90	181.8±0.73	85	175.4± 0.85

*Values for females only from 20 weeks onwards

Implementation of STC component

During 2022-23, a total of six trainings were organized for TSP farmers under TSP component of the project. Poultry inputs such as chicks, feeder, waterers were supplied to TSP farmers. A total of 4650 chicks, 310 feeder and waters were distributed to 310 TSP farmers under TSP component of the project. The TSP farmers of Udaipur, Pratapgarh, and Rajsamand districts were benefitted in the TSP component of the project.

Germplasm supply

A total of 41,836 germplasm (41,760 live birds and 76 hatching eggs) was supplied 769 farmers during the current year.

Revenue generation

The centre realized a receipt of Rs.12.09 lakhs during the current financial year, which was 89.09% of the expenditure on feed cost (Rs 13.57 lakhs).

ICAR Research Complex for NEH Region, Agartala (Tripura)

Activities assigned

- Collection and evaluation of the local native chicken.
- Procurement and evaluation of improved chicken germplasm in the local climatic conditions.
- Production and evaluation of cross of local native chickens with improved germplasm
- The centre has to work on development of germplasm for rural poultry for the region utilizing native chicken population.

Action taken

- During the present year, the centre evaluated the *Tripura black, Dahlem Red*, Coloured Synthetic Female Line (CSFL), BN cross and BND cross.
- Three-way cross was evaluated in E-6 generation up to 72 weeks of age and E-7 generation up to 52 weeks of age.
- Performance of dual-purpose chicken (BND cross) was evaluated at institute farm as well as the farmer's fields conditions.

Achievements

During the period the centre hatched 2387 good chicks of *Tripura black* and evaluated up to 20 weeks of age. *Dahlem Red*, Coloured Synthetic Female Line (CSFL) and BN cross was also evaluated up to 20 weeks of age at farm. The body weight at 20 weeks was 1223, 1422, 2703 and 1793g in *Tripura Black, Dahlem Red*, CSFL and BN cross respectively. In E-6 evaluation of BND cross, 72 weeks egg production was 159.32 eggs under farm and 138.76 under field conditions. E-7 evaluation of BND cross was completed up to the 52 weeks of age at farm and 40 wks of age at field condition. During E-7 evaluation of BND cross, the 40 weeks egg production was 64.38 and 54.12 eggs under farm and field conditions, respectively.

Incubation records

A total of 24,175 chicks of different varieties / lines of chicken were produced. The overall average fertility was estimated 84.26% in different breeds/varieties/ lines of chicken. The fertility ranged from 83.63 to 87.55%. The fertility improved in *Tripura Black* and BN crosses compared to previous generations. The overall hatchability on fertile

Table 1. Summary of incubation and hatching of different populations

Strains	Year	Eggs set (Nos.)	Fertile eggs (Nos.)	Fertility (%)	Hatchability (%)		Good Chicks (Nos.)
					TES	FES	
Tripura Black	2020-21	15718	13346	84.91	72.30	85.15	11364
	2021-22	2041	1584	77.61	59.28	76.39	1210
	2022-23	**3689**	**3230**	**87.55**	**64.70**	**73.90**	**2387**
CSFL	2020-21	4409	3858	87.50	69.27	79.16	3054
	2021-22	1826	1569	85.93	62.43	72.66	1140
	2022-23	**1228**	**1027**	**83.63**	**66.36**	**79.35**	815
Dahlem Red	2020-21	4998	3898	77.99	51.84	66.47	2591
	2021-22	9806	8444	86.11	56.69	65.83	5559
	2022-23	**3561**	2987	83.88	64.64	77.06	2302
BN cross (50%)	2020-21	3028	2482	81.97	69.55	84.85	2106
	2021-22	5330	4283	80.36	62.29	77.52	3320
	2022-23	**1878**	**1586**	**84.45**	**64.74**	**76.67**	**1216**
BND cross (Dual type)	2020-21	26038	21940	84.26	66.79	79.27	17392
	2021-22	33794	28965	85.71	65.38	76.29	22096
	2022-23	**27028**	**22672**	**83.88**	**64.58**	**76.98**	**17455**

egg set (FES) and total egg set (TES) were estimated; 76.74% and 64.66%, respectively. The hatchability on total eggs set was improved in *Dahlem Red, CSFL, Tripura Black* and BN Cross as compared to the previous generations. The hatchability on fertile egg set (73.90 to 79.35%) was also improved in *Dahlem Red, CSFL* and BND cross populations as compared to previous generation. The highest hatchability on FES and TES was recorded in CSFL. The lowest hatchability on FES and TES was in *Tripura Black* and BND Cross respectively (Table 1).

Mortality

The mortality during brooding period was lowest in BND Cross and highest in CSFL. Mortality during growing period ranged from 0.94 to 8.97% and during laying period it ranged from 1.13 to 5.99% (Table 2).

Performance of *Tripura black, Dahlem Red* and CSFL

The performance of *Tripura black (G-12 generation), Dahlem Red (G-10)* and Coloured Synthetic Female Line (*G-12*) was evaluated up to 20 weeks of age at the institute farm. Whereas the performance of previous generation of *Tripura Black* (*G-11*) and *Dahlem Red* (*G-9*) also has been completed up to 52 weeks at farm during this year reporting period. The body weight of female birds and pooled body weight at 40 weeks of age in *Tripura Black* was more than previous generation. Pedigreed population of Tripura black with random mating is being maintained.

In G-12 generation of Tripura black, the body weight of female and pooled sex at 20 weeks during 2022-23 was less in comparison to previous generation. In present generation of CSFL (G-12) and *Dahlem Red* (G-10), the body weight of female and pooled sex at 20 weeks during 2022-23 was less as compared to previous generations. The egg production up to 40 weeks and 52 weeks of age showed slightly reduction in *Tripura Black*. Whereas, egg production in *Dahlem Red* up to 52 weeks of age was found 113.50. The average egg weight of *Tripura Black* (at 40 week) was found less as compare to the previous generation (Table 3).

Table 2. Mortality (%) at different ages in different populations

Strain	Year	0-6 wks	7-20 wks	21-40 wks	41-72 wks
Tripura Black	2020-21	1.681	5.782	1.520	4.716
	2021-22	3.66	5.83	-	2.57
	2022-23	**14.91**	**0.94**	**2.1**	**1.69**
Dahlem Red	2020-21	6.201	6.951	1.565	1.759
	2021-22	7.62	11.82	1.06	0.97
	2022-23	**12.11**	6.21	1.36	1.13
CSFL	2020-21	2.085	2.156	0.705	0
	2021-22	6.40	9.46	0.76	0.22
	2022-23	**20.59**	**4.9**	**0**	**0**
BN cross (50%)	2020-21	3.259	19.061	0.823	1.771
	2021-22	6.03	2.71	1.70	1.52
	2022-23	**17.60**	**8.97**	**4.34**	**5.99**
BND cross (Dual type)	2020-21	6.386	5.855	0.099	1.612
	2021-22	7.56	9.52	1.67	2.66
	2022-23	**11.75**	**4.3**	**2.25**	**1.46**

Table 3. Performance of different pure lines at the institute farm

Traits	N	*Tripura Black*		N	*Dahlem Red*		N	CSFL	
		G-12	G-11		G-10	G-9		G-12	G-11
Body weight (g)									
Day old	542	29.37±0.17	29.23±0.28	388	34.10±0.14	34.20±0.21	101	**40.31±0.37**	42.67±0.35
4 wks	370	142.8±2.76	141±3.01	359	137.5±1.62	138.4±2.56	81	**316.5±6.47**	325±7.2
8 wks	131	349.9±12.9	298±6.86	346	461.2±6.47	481.9±10.6	62	**707.1±26.8**	710.9±14.1
12 wks	98	552.4±16.8	548±13.3	338	812.7±7.94	850±25.03	58	**1400±38.6**	1404±30.0
20 wks	86	1223±28.7	1280±41.9	328	1422±25.9	1483±31.3	54	**2703±39.7**	2781±41.4
Males	23	1473±73.6	1456±51.9	59	2370±21.6	1802±44.2	19	**2879±40.4**	2970±57.8
Females	63	1132±18.4	1137±33.9	269	1215±9.3	1298±25.4	35	**2501±20.5**	2528±27.8
40 wks		-	**1662±46.9**		-	1965±38.9		-	3089±51.6
Males		-	1822±68.7		-	2408±46.6		-	3485±40.0
Females		-	**1555±48.2**		-	1714±26.7		-	2673±30.4
AFE in the flock (d)		-	**140**		-	122		-	154
ASM, (d)		-	**170±1.88**		-	160±1.22		-	182±1.41
EP 40 wks (Nos.)									
HH		-	**40±0.70**		-	73.40±0.30		-	56.97±0.44
HD		-	**41.29**		-	74.36		-	57.63
Survivors'		-	**42.66±0.59**		-	76.22±0.21		-	59.83±0.92
EP 52 wks (Nos.)									
HH		-	**65±0.35**		-	**113.5±0.33**		-	**75.86±0.36**
HD		-	**67.09**		-	**116.17**		-	**81.47**
Survivors'		-	**69.33±0.32**		-	**120.9±0.57**		-	**83.84±0.42**
EW 40 wks (g)		-	**43.81±0.54**		-	**58.85±0.60**		-	**59.49±0.55**

Performance of BN cross

The performance of BN cross populations was evaluated up to 20 weeks of age. The body weight of female at 20 weeks was 1624g which was slightly higher to previous generation and body weight of pooled sex at 20 weeks of age was slightly lower as compared to previous generation (Table 4).

Performance of Three Way Cross (BND Cross)

The three-way cross was named as '*Toqbari*' and the proposal was submitted to the ICAR-NBAGR through the nodal agency for release. In E-6 evaluation of BND cross was completed and, the 72 weeks egg production was 159.3 eggs under farm and 138.8 eggs at farmers' fields. E-7 evaluation of BND cross was completed up to 52 weeks under farm and field conditions up to 40 weeks of age. During E-7 evaluation of BND cross, the 40 weeks egg production was 64.38 and 54.12 eggs under farm and field conditions, respectively. The body weight recorded in E-7at 20 and 40 weeks of age slightly increased in comparison to previous (E-6) evaluation under farm. The age at sexual maturity was almost similar to previous (E-6) evaluation under farm. The egg weight recorded at field was almost similar while that recorded at farm was slightly decreased compared to previous evaluation (Table 5).

Table 4. Performances of BN cross at the institute farm

Traits	N	2022-23	2021-22
Body weight (g)			
Day old	159	**34.29±0.22**	34.77±0.28
4 wks	126	**230.7±3.68**	233±6.22
8 wks	104	**714.3±11.3**	726±14.47
12 wks	87	**1235±17.8**	1236±29.61
20 wks	72	**1793±30.1**	1796±48.80
Males	29	**2042±30.6**	2061±55.77
Females	43	**1624±21.9**	1611±53.46
40 wks Pooled sex			1911±39.64
Males			2036±46.77
Females			1834±52.90
AFE in the flock (d)			130
ASM (d)			162±1.5
EP 40 wks (Nos.)			
HH			42.70
HD			46.72
Survivors'			48.59
EP 52 wks (Nos.)			
HH			64.03
HD			72.86
Survivors'			75.46
EW 40 wks, g			51.38±0.73

Table 5. Performance of BND cross (*Toqbari*)

Traits	BND cross (E-7)				BND cross (E-6)	
Body weight (g)	**N**	**Farm**	**N**	**Field**	**Farm**	**Field**
Day old	473	35.12±0.12	-	-	35.01±0.14	-
4 wks	385	177.5±2.99	415	167.37±2.32	168.24±1.63	160.57±1.88
8 wks	362	454.3±4.19	386	362.2±8.02	453.79±4.42	326.4±4.66
12 wks	348	763.2±5.73	239	729.4±23.41	760.49±5.76	724.9±11.59
20 wks	272	1627±18.08	150	1503±38.87	1622±15.36	1509±37.77
Males	30	2059±38.83	31	1809±98.11	1910±19.44	1780±63.92
Females	242	1573±16.80	119	1423±38.80	1479±11.83	1354±36.75
40 wks	219	1913±18.97	117	1894±41.30	1925±24.89	1872±40.05
Males	46	2327±26.73	45	2365±38.04	2437±24.82	2322±35.72
Females	173	1679±13.75	72	1600±28.34	1677±17.21	1605±28.80
AFE (d)	192	136.5	78	139	132	136.36
ASM (d)	190	162.2±1.03	75	-	160±1.21	-
EW 40 wks (g)	91	53.04±0.45	64	48.81±0.46	54.67±0.61	48.69±0.91
Egg production, (Nos.)						
40 wks	146	64.38±0.80	58	54.12	66.16±1.60	53.22
52 wks	76	93.35±1.53	-	-	92.16±2.24	**83.15**
72 wks	-	-	-	-	**159.3±2.9**9	**138.**8

Training programs

A total of thirteen training programs on backyard poultry farming for rural farmers were organized at different places of Tripura to improve the skills for augmenting poultry production. A total of 549 rural farmers were trained on all aspects of poultry farming like general care and management, breeds and breeding management, formulation of balance ration using locally available cheap feed ingredients, disease and health management were covered.

Germplasm supply

A total of 19,081 germplasm was supplied to the 623 farmers during the reporting period.

Revenue generation

The centre realized overall receipt of Rs.10.70 lakhs which was 114.4% of the expenditure on feed cost (Rs. 9.35 lakhs).

Assam Agricultural University, Guwahati (Assam)

Activities Assigned

- Evaluation and improvement of the local native chicken germplasm and to be maintained as pure line.
- Procurement and evaluation of improved chicken germplasm in the local climatic condition.
- Evaluation of new variety *Kamrupa* in different agro-climatic conditions.

Action Taken

- Native chicken (Non-Descript) were evaluated under the farm conditions.
- A cross (PB-2 x Native chicken) was evaluated up to 72 weeks.
- The performance of *Dahlem Red* birds procured from ICAR-DPR, Hyderabad was evaluated.
- The *Kamrupa* was evaluated in the farm and field condition up to 72 weeks of age.
- Performance of *Daothigir* birds procured originally from Kokrajhar district is under evaluation.

Achievements

A total of 638 numbers of Native (ND) chicks, growers and adult are kept in the farm and their performances are under evaluation. A flock of 420 birds of BN cross (PB-2 x Native) have been maintained at the centre and their performance is studied. The performance of 733 birds of *Dahlem Red* procured from DPR, Hyderabad was evaluated up to 72 weeks. A flock of 950 birds of *Kamrupa* have been kept in the centre and their performance was evaluated in the farm and field condition up to 72 weeks. Performance of a flock of 689 birds of *Daothigir* procured originally from Kokrajhar district is under evaluation.

Incubation records

Summary of incubation records has been presented in Table 1. The average fertility of all the flocks was 89.36 %. The hatchability on total eggs set ranged from 55.41 to 83.11%. Hatchability in indigenous chicken has comedown but in other population it almost remained similar to the previous generation.

Mortality

The mortality during the current year is presented in Table 2. The mortality during brooding and growing period was below 4.64% in all the lines. The mortality during laying period was below 3.49%.

Performance evaluation of pure-bred germplasm

The juvenile and production traits in indigenous, *Dahlem Red* are presented in Table 3. The 5 weeks body weight was 185.80 g in indigenous and 445.60 g in *Dahlem Red*. The ASM was lowest in *Dahlem Red* (158.30 days) and highest in indigenous (172.6 days). *Dahlem Red* pullet matured late by 0.20 days early compared to previous generation. In native population, the egg weight and egg production up to 72 weeks was 42.10g and 112.10 eggs, respectively. The juvenile and production traits in *Daothigir* are presented in Table 4. The 20- and 40-weeks body weight was 1190 and 1840g, respectively. The Age at sexual maturity was 198.2 days. The egg weight and egg production up to 72 weeks was 36.80 g and 116.70 eggs, respectively.

Table 1. Summary of incubation and hatching

Strain	Year	Eggs set (Nos.)	Fertility (%)	Hatchability (%)		Good chicks (Nos.)
				TES	FES	
Native (ND)	2021-22	1420	80.98	66.76	82.43	948
	2022-23	**749**	**79.31**	**55.41**	**69.87**	**415**
BN cross	2021-22	881	67.65	55.73	82.38	491
	2022-23	**421**	**67.46**	**55.58**	**82.39**	**234**
BND cross	2021-22	44953	90.25	84.97	94.15	38198
	2022-23	**27435**	**90.14**	**83.11**	**92.20**	**22802**
Daothigir	2021-22	1398	80.33	67.31	83.79	941
	2022-23	**458**	**79.26**	**65.94**	**83.20**	**302**

Table 2. Mortality at different periods

Strain	Year	0-5 wks	6-20 wks	21-40 wks	41-52 wks
Native (ND)	2021-22	2.27	2.08	1.31	1.07
	2022-23	**2.26**	**2.21**	**1.40**	**0.98**
PB-2	2021-22	3.13	3.23	2.22	3.41
	2022-23	-	-	-	-
Dahlem Red	2021-22	4.24	4.18	1.51	0.90
	2022-23	**3.96**	**4.40**	**1.78**	**0.91**
BN cross	2021-22	1.91	1.38	2.09	0.71
	2022-23	**2.05**	**1.61**	**2.29**	**0.84**
BND cross	2021-22	3.41	2.43	2.31	0.73
	2022-23	**3.70**	**2.60**	**2.49**	**0.81**
Daothigir	2021-22	4.59	4.13	3.34	2.55
	2022-23	**4.64**	**4.11**	**3.49**	**1.15**

Table 3. Juvenile and production traits in pure lines

Traits	Native chicken		***Dahlem Re***d	
	N	Mean ± SE	N	Mean ± SE
Body weight (g) (Pooled sex)				
Day old	500	35.40 ± 0.48	550	38.10 ± 0.16
5 wks	460	185.8 ± 0.36	510	445.6 ± 2.01
20 wks	430	1350 ± 2.76	470	1420 ± 3.02
40 wks	410	1780 ± 4.76	440	1970 ± 6.92
FCR up to 5 weeks	460	3.10	510	2.70
Conformation traits at 5 weeks of age				
Shank length(mm)	460	49.70 ± 0.16	510	61.20 ± 0.11
Keel length(mm)	460	52.80 ± 0.23	510	54.60 ± 0.14
Breast Angle (o)	460	57.20 ± 0.23	510	63.90 ± 0.21
ASM (days)	280	172.6 ± 0.30	450	158.3 ± 0.24
Egg weight (g)				
32 wks	250	37.20 ± 0.20	450	49.80 ± 0.24
40 wks	240	38.40 ± 0.28	430	59.70 ± 0.15
52 wks	230	41.30 ± 0.32	400	61.90 ± 0.17
72 wks	210	42.10 ± 0.39	380	62.90 ± 0.22
EP 40w (Nos.)				
Hen housed	280	40.70	450	64.50
Hen day	-	42.80	-	66.20
Survivors'	230	43.10	410	68.40
EP 52 w (Nos.)				
Hen housed	280	70.60	450	122.1
Hen day	-	72.10	-	123.6
Survivors'	220	75.40	390	125.9
EP 72w (Nos.)				
Hen housed	280	112.1	450	215.8
Hen day	-	113.9	-	217.8
Survivors'	180	116.4	340	221.6

Table 4. Juvenile and production performance of *Daothigir*

Traits	*Daothigir*	
	N	Mean ± SE
Body weight (g) (Pooled sex)		
Day old	550	27.30 ± 0.12
5 wks	500	280.4 ± 1.30
20 wks	470	1190 ± 3.05
40 wks	450	1840 ± 4.32
FCR up to 5 wks	500	3.10
Conformation traits at 5 weeks of age		
Shank length (mm)	500	51.30 ± 0.17
Keel length (mm)	500	55.70 ± 0.19
Breast Angle (o)	500	42.20 ± 0.18
ASM (days)	250	198.2 ± 0.55
Egg weight (g)		
32 wks	250	32.40 ± 0.20
40 wks	230	35.30 ± 0.26
52 wks	220	37.10 ± 0.27
72 wks	200	40.29 ± 0.31
EP 40w (Nos.)		
Hen housed	250	38.80
Hen day	-	40.70
Survivors'	230	41.40
EP 52w (Nos.)		
Hen housed	250	65.60
Hen day	-	67.80
Survivors'	210	70.90
EP 72w (Nos.)		
Hen housed	250	116.7
Hen day	-	118.6
Survivors'	200	122.1

Performance evaluation of crosses

The Juvenile and production performance of BN crosses (two-way cross) is presented in Table 5**.** The five-week body weight was 390.8 g and FCR was 2.90 in BN cross. The age at sexual maturity was 164.9 days and remained almost similar as compared to previous generation. The hen housed egg production up to 72 weeks was 124.2 eggs. Almost all the parameters are same as compared to previous generation.

The *Kamrupa* (BND cross), three-way cross was evaluated up to 72 weeks in farm and field conditions during the current year (Table 6). The 5-week body weight was 410.3 g and 310.4 g in the farm and field, respectively. The age at sexual maturity was 148.6 days in the farm and 169.4 days in the field. The egg weight at 40 weeks of age was 57.80 g and 43.40 g in farm and field, respectively. The hen housed egg production up to 40 weeks, 52 weeks and 72 weeks of age was 51.30, 92.90 and 155.7 eggs in the farm and corresponding values in the field were 45.60, 75.80 and 124.6 eggs, respectively. The performance of cross was slightly improved over last two generations.

Table 5. Juvenile and production performance of two way cross (BN) at farm conditions

Traits	N	Mean ± SE
Body weight (g)		
Day old	400	37.20 ± 0.22
5 weeks	380	390.8 ± 3.57
20 weeks	350	1970 ± 8.11
40 weeks	320	2790 ± 13.42
FCR up to 5 weeks	380	2.90
Conformation traits at 5 weeks of age		
Shank length (mm)	380	52.60 ± 0.18
Keel length (mm)	380	54.30 ± 0.25
Breast Angle (o)	380	68.70 ± 0.34
ASM (days)	230	164.9 ± 0.42
Egg wt (g)		
32 wks	200	47.40 ± 0.16
40 wks	180	50.20 ± 0.45
52 wks	170	60.30 ± 0.44
72 wks	150	60.70 ± 0.39
EP 40w (Nos.)		
Hen housed	230	41.30
Hen day	-	42.90
Survivors'	180	45.60
EP 52w (Nos.)		
Hen housed	230	74.60
Hen day	-	75.70
Survivors'	170	78.90
EP 72w (Nos.)		
Hen housed	230	124.2
Hen day	-	127.6
Survivors'	140	129.8

Table 6. Juvenile and production performance of *Kamrupa* (BND cross)

Traits	Field		Farm	
	N	Mean ± SE	N	Mean ± SE
Body weight (g)				
Day old	500	38.90 ± 0.12	550	38.90 ± 0.11
5 wks	490	310.4 ± 0.27	530	410.3 ± 1.26
20 wks	460	1220 ± 3.92	520	1560 ± 4.56
40 wks	430	1960 ± 12.25	500	2480 ± 15.30
FCR up to 5 weeks	490	-	530	2.70
Conformation traits at 5 weeks of age				
Shank length (mm)	490	51.60 ± 0.18	530	49.80 ± 0.17
Keel length (mm)	490	55.60 ± 0.26	530	51.60 ± 0.28
Breast Angle (o)	490	53.80 ± 0.21	530	69.30 ± 0.36
ASM (days)		169.4*	300	148.6 ± 0.35
Egg weight (g)				
32 wks	250	41.80 ± 0.20	250	51.80 ± 0.29
40 wks	240	43.40 ± 0.39	240	57.80 ± 0.31
52 wks	230	45.80 ± 0.36	230	61.10 ± 0.34
72 wks	200	46.20 ± 0.42	220	60.70 ± 0.43
EP 40w (Nos.)				
Hen housed	220	45.60	300	51.30
Hen day	-	46.70	-	53.30
Survivors'	170	48.40	250	55.30
EP 52w (Nos.)				
Hen housed	220	75.80	300	92.90
Hen day	-	77.20	-	95.30
Survivors'	180	80.30	230	96.40
EP 72w (Nos.)				
Hen housed	220	124.6	300	155.7
Hen day	-	125.8	-	158.9
Survivors'	150	131.4	220	162.6

*Birds are considered sexually matured when 10 % of flock starts laying. The ASM in field conditions was assessed by gathering data from 30 farmers.

Germplasm supply

The centre supplied 26,874 (4572 hatching eggs and 22,302 chicks/growers of *Kamrupa*) germplasm to 250 number of farmers.

Revenue generation

The centre realized receipt of Rs. 6.16 lakhs during the financial year which is 26.0% of expenditure on feed cost (Rs. 23.70 lakhs).

Nanaji Deshmukh Veterinary Science University, Jabalpur (Madhya Pradesh)

Activities assigned

- Evaluation and improvement of the *Kadaknath* breed of chicken and to maintain it as a pure line.
- Evaluation of improved chicken germplasm (*Jabalpur colour*) in the local climatic conditions for development of cross.
- Evaluation of terminal cross (*Narmadanidhi*) in different agro-climatic conditions.
- Conducting training programme for farmers under TSP component of the project and supply of chicks to the farmers.

Action taken

- The centre maintained *Kadaknath*, *Jabalpur colour* and *Kadaknath* cross populations.
- During the current year centre evaluated G-2 generation of *Kadaknath* and *Jabalpur colour* population from 7 weeks to 72 weeks of age.
- The *Narmadanidhi* commercial birds were evaluated under farm and field conditions up to 72 weeks age.
- Under TSP component of the project, trainings conducted for rural farmers and chicks/ germplasm were supplied round the year to the farmers.

Achievements

Selection records

The G-2 Generation of *Kadaknath* and *Jabalpur colour* were reproduced from G-1 sires and dams of *Kadaknath* population and JB colour birds respectively. Females from first generations are selected based on their egg production records up to 40 weeks and males based on their semen production to produce second generation of *Kadaknath* and *Jabalpur colour birds.* Various selection parameters like Number of sires and dams used, effective number, rate of inbreeding and selection intensity is presented in Table 1.

Table 1. Summary of selection records of *Jabalpur colour* and *Kadaknath* (G-2 gen.) (2022-23)

Sr. No.	Particulars	*Jabalpur colour* (G-1)	*Kadaknath* (G-1)
1	No. of sires used	80	60
2	No. of dams used	480	300
3	No. of sires contributed to the next generation	80	60
4	No. of dams contributed to the next generation	480	300
5	Effective Nos. using Sr. No.3 & 4	316.5	156.3
6	Rate of inbreeding	0.0023	0.0028
7	Expected S. D. in females of G-1 generation	--	--
8	Phenotypic standard deviation of 40 weeks egg prod.	--	--
9	Intensity of selection	0.45	0.32
10	Heritability of 40 weeks egg production	--	--
11	Expected response	--	--

Incubation records

Fertile eggs collected after artificial insemination after proper cleaning and fumigation were set in incubator. Proper temperature, humidity and turning were maintained in incubator and monitored twice in a day. On day 18th eggs were candled and fertile eggs were transferred to hatcher. On 21st day chicks hatched. Improvement in fertility per cent was recorded in G-2 *Jabalpur colour*, *Kadaknath* and *Kadaknath* cross (50% *Kadaknath* and 50% *Jabalpur colour*) as compared to previous generation. Hatchability on total egg set basis as well as fertile egg set basis was improved than previous generation in *Jabalpur colour*, *Kadaknath*, and *Kadaknath* cross (Table 2).

Mortality

The percent mortality was recorded in different intervals in *Jabalpur colour, Kadaknath and Kadaknath* Cross in second generation. The per cent mortality was within the permissible range in all the germplasms and no specific disease was reported (Table 3).

Table 3. Mortality record in *Jabalpur colour*, *Kadaknath* and *Kadaknath* cross

Breed/ variety/cross	Year	Mortality (%)			
		0-6 wks	6-20 wks	20-40 wks	40-72 wks
Jabalpur colour	G-1	6.01	3.37	3.57	4.88
	G-2	6.07	4.35	3.89	4.92
Kadaknath	G-1	5.88	3.38	3.27	5.01
	G-2	5.88	3.38	3.27	5.01
Kadaknath Cross	G-1	6.06	3.66	3.50	-
	G-2	5.76	3.79	3.58	5.04

Performance of pure lines and different crosses

Growth and production performance of *Jabalpur colour* population

Body weight was recorded in different intervals – 6 weeks, 20 weeks, 40 weeks, 52 weeks and 72 weeks. Slight improvement was observed in body weight than the G-1 generation. Age at sexual maturity was also lowered as compared to previous generation. Egg weight at 20 and 40 weeks of age in G-2 was found almost similar to G-1, whereas egg production at 40, 52 and 72 weeks was little bit better than G1 generation flock (Table 4).

Table 4. Production Performance of *Jabalpur colour* population

Traits	G-2 gen (2022-23)		G-1 gen (2021-22)	
	N	Mean±SE	N	Mean±SE
Body weight (g)				
6 wks	3158	705.3 ± 83	2695	702.5 ±78
20 wks	624	1563 ± 17.4	480	1555 ± 26.3
40 wks	600	2004 ± 14.5	450	1940 ± 27.3
52 wks	588	2140 ± 15.3	442	2100 ± 25.3
72 wks	571	2761 ± 20.1	400	2710± 21.3
ASM (days)	630	155 ± 1.5	480	156 ±1.05
Confirmation traits at 6 wks of age				
Shank length (cm)				
Males	1428	7.65± 0.04	1215	7.68 ±0.03
Females	1730	7.09±0.03	1480	7.15±0.05
Keel length (cm)				
Males	1428	8.18± 0.05	1215	8.17±0.04
Females	1730	7.87±0.02	1480	7.85 ±0.02
Breast angle (º)				
Males	1428	60.80± 1.23	1215	60.50 ±1.18
Females	1730	58.50 ±1.07	1480	58.70 ±1.23
Egg weight (g)				
20 wks	624	48.6 ± 0.41	471	48.5 ± 0.31
40 wks	600	55.6 ± 0.35	450	55.4 ± 0.27
EP 40 wks (Nos.)				
Hen housed	600	97.10 ±1.46	450	96.0 ± 1.47
Hen day		99.8 ± 2.31		99.3 ± 1.95
EP 52 wks (Nos.)				
Hen housed	588	156.0± 1.34	442	155.0 ± 1.41
Hen day	-	162.0± 1.45		161.0 ± 1.60
EP 72 wks (Nos.)				
Hen housed	571	239.0± 2.14	400	238.0 ± 2.08
Hen day	-	248.6± 1.98	-	247.5 ± 2.12

Growth and Production performance of *Kadaknath* population

Body weight was recorded in different intervals – 6 weeks, 20 weeks, 40 weeks, ,52 weeks and 72 weeks. Slight improvement was observed in body weight than the G-1 generation. Age at sexual maturity was also lowered as compared to previous generation. Egg weight at 20 and 40 weeks of age in G-2 was found almost similar to G-1, whereas egg production at 40, 52 and 72 weeks showed slight improvement than G1 generation flock (Table 5).

Table 5. Performance of *Kadaknath* population

Traits	G-2 gen (2022-23)		G-1 gen (2021-22)	
	N	Mean ± SE	N	Mean ± SE
Body weight (g)				
6 wks	975	402.3 ± 7.4	900	398.1 ±7.4
20 wks	341	1123 ±12.3	315	1098 ± 21.5
40 wks	328	1514 ±17.3	300	1500 ± 20.5
52 wks	322	1690 ± 11.1	275	1640 ± 23.2
72 wks	316	2016 ± 18.4	250	1905± 27.8
ASM (days)	341	167 ± 2.40	315	169 ± 1.16
Confirmation traits at 6 wks of age				
Shank length (cm)				
Males	435	6.76 ± 0.08	410	6.95 ±0.04
Females	540	5.97 ± 0.05	490	6.05 ±0.04
Keel length (cm)				
Males	435	7.30 ± 0.07	410	7.42 ±0.03
Females	540	7.05 ± 0.03	490	7.10 ±0.05
Breast angle (°)				
Males	435	55.20±1.08	410	57.0± 0.08
Females	540	51.31±1.07	490	52.7± 1.02
Egg weight (g)				
20 wks	341	40.8 ±.13	308	40.5 ±0.05
40 wks	328	48.7 ±.34	300	48.2 ±0.30
EP 40 wks (Nos.)				
Hen housed	328	59.0 ± 1.11	300	58.1 ± 1.90
Hen day		64.0 ± 2.12	-	63.0 ± 1.70
EP 52 wks (Nos.)				
Hen housed	322	92.8 ± 2.30	275	91.8 ± 2.01
Hen day		94.4 ± 2.40	-	93.2 ± 1.40
EP 72 wks (Nos.)				
Hen housed	316	111.6 ± 1.31	250	110.5 ± 1.69
Hen day		118.1 ± 2.33	-	116.7 ± 1.80

Table 6. Performance of *Narmadanidhi* under farm and field (2022-2023)

Particulars	Farm		Field	
	N	Mean ± SE	N	Mean ± SE
Body weight at 8 wks (g)				
Males	95	1010 ± 20.3	100	772 ± 11.6
Females	155	725 ± 11.5	200	687 ± 3.8
Body weight at 20 wks (g)				
Males	90	1506 ± 23.3	90	1436 ± 18.7
Females	145	1384 ± 20.4	193	1206 ± 28.6
ASM (d)	145	168 ± 1.3		-
Egg production (Nos.)				
40 wks	140	58 ± 1.6	188	42 ± 3.5
52 wks	136	109 ± 1.9	180	93.2 ± 1.2
72 wks	130	222 ± 2.2	169	176 ± 2.2
EW 40 wks (g)	140	49.0 ± 0.2	188	48.5±0.09

Growth and production performance of *Narmadanidhi*

Narmadanidhi (commercial dual type colour chicks) (75% *Jabalpur colour* and 25% *Kadaknath*) were evaluated both under farm and field conditions. Body weight was recorded at 8 weeks and 20 weeks in farm and field condition. Body weight under farm rearing was recorded to be higher than field rearing in male as well as in female birds in both intervals. Egg production at 40 weeks, 52 weeks and 72 weeks of birds in farm were observed higher than birds reared in field. The egg weight and shell colour were similar in farm and field reared birds (Table 6). The birds have shown better survivability in field rearing.

Implementation of STC component

Under STC/TSP component of the project 8 trainings were organized at villages viz Ghugri (01) of Mandla district, Badhiyakheda, Bargi (06) and at poultry farm Adhartal (01) Jabalpur. A Total 160 farmers (Male & Female) participated in the training programme. After successful completion of trainings inputs including *Narmadanidhi* chicks, feed and equipment (feeders & Waterers) were provided to the tribal farmers.

Germplasm supplied

A total of 34,978 germplasm (chicks/fertile eggs/ growers) were supplied to 250 farmers.

Revenue generation

The centre realized a receipt of Rs. 14.69 lakhs which was 121% of the expenditure on feed cost (Rs 12.06 lakhs).

Birsa Agricultural University, Ranchi (Jharkhand)

Activities assigned

- Genetic improvement of native chicken for body weight as well as egg production may be practiced for brining faster genetic gain in the terminal crosses.
- Evaluation and improvement of the local native chicken germplasm and to be maintained as pure line.
- Procurement and evaluation of improved chicken germplasm in the local climate condition.
- The centre will work on development of new varieties suitable for rural poultry in the region utilizing local germplasm.

Action taken

- The centre evaluated G-9 generation of native population up to 72 weeks of age, G-10 up to 72 weeks of age and G-11 up to 4 weeks of age.
- The *Dahlem Red* G-9 generation was evaluated up to 72 weeks of age and G-10 up to 64 weeks of age.
- Evaluation of *Jharsim* in E-10 up to 72 weeks of age and E-11 up to 4 weeks of age under farm and field conditions.

Achievements

The centre evaluated G-10 generation up to 72 weeks of age. The G-9 generation was reproduced with 400 chicks 200 chicks evaluated up to 72 weeks and 250 chicks were produced and half sib pedigree was recorded up to 20 weeks of age.

Incubation records

The fertility improved in pure line and crosses from the previous year 2021-22 (Table 1). The hatchability and total egg set was lower in native chicken. The hatchability on total egg set and fertile egg set basis showed improvement from the previous year in both germplasms.

Mortality

During the current year mortality during brooding period was reduced, it was lower side in current year. Mortality during growing stage was also slightly on higher side ranging. During laying period mortality was also lesser (Table 2).

Table 1. Summary of incubation and hatching results for the period

Strains	Year	Eggs set (Nos.)	Fertility (%)	Hatchability (%)		Chicks hatched (No.)
				TES	FES	
Native chicken	**2022-23**	**10856**	**87.60**	**66.36**	**75.76**	**7205**
	2021-22	12320	87.24	66.03	75.68	8125
Jharsim cross	**2022-23**	**35743**	**97.22**	**86.47**	**88.94**	**30910**
	2021-22	45576	96.69	85.91	88.84	39155

Table 2. Mortality (%) in different population at different ages

Breeds/strains	Year	0-6 wks	7-18 wks	19-40 wks
Native	**2022-23**	**4.80**	**2.90**	**4.61**
	2021-22	4.85	3.02	4.67
Dahlem Red	**2022-23**	**4.92**	**4.94**	**5.11**
	2021-22	4.97	5.02	5.18
PB-2	**2022-23**	**3.97**	**4.02**	**5.07**
	2021-22	4.04	4.10	5.16
PB2 x Desi	**2022-23**	**4.04**	**2.98**	**3.91**
	2021-22	4.13	3.07	3.98
Jharsim	**2022-23**	**5.13**	**5.08**	**4.16**
	2021-22	5.21	5.14	4.23

Performance evaluation of germplasms

The 72 weeks egg production of native chicken in G- 10 generation as come down has compared to the G-9 generation (Table 3). Native (G-11) body weight were 28.56±0.14, 172.45±0.75, at day old and 4, weeks of age. In *Dahlem Red* also the 72 weeks egg production has come down in the G-9 generation as compare to the G-8 generation (Table 3). Body weight of *Dahlem Red* (G-10) at 0 day and 4 weeks of age was 30.71±0.20 and 183.29±0.76 g, respectively. The egg weight of *Dahlem Red* (G-9) at 40 weeks of age is not available. The body weight of PB-2 (N=100) at 0 day and 4 weeks and 8 weeks of was 33.07±0.25, 199.8±1.79 and 565.0±3.35g, respectively. The production performance of PB-2 in E-7 evaluation is not available

Table 3. Production performance of native and *Dahlem Red* populations

Traits	Native chicken		*Dahlem Red*	
	G-10 gen.	G-9 gen.	G-9 gen.	G-8 gen.
Egg wt. 40 wks (g)	**42.29±0.26**	-	-	-
Age at first egg (d)	**172**	-	**164**	-
EP40 wks (No.)		-		-
HD	**32.17**		**37.85**	
HH	**31.56**		**37.02**	
EP52 wks (Nos.)		-		-
HD	**68.24**		**86.13**	
HH	**65.80**		**83.31**	
EP64 wks (Nos.)		-		-
HD	**105.92**		**142.89**	
HH	**101.70**		**136.93**	
EP72 wks (Nos.)				
HD	**150.53**	**176.32**	**182.54**	**166.64**
HH	**144.43**	**168.73**	**174.47**	**159.96**

Performance evaluation of *Jharsim (Farm)*

Among three-way crosses, *Jharsim* (E11) was evaluated up to 4 weeks of age. The body weight at day old and 4 weeks of age was 32.08±0.18, 186.26±0.75(g), receptively. The 72 weeks hen day housed and hen housed egg production of *Jharsim* (E9) was 176.32 and 168.73, respectively. The production performance of *Jharsim* (E10) and PB2 X Native (E7) is presented in Table 4. Egg weight of PB2 X Native (E7) at 40 weeks of age is not provided.

Table 4. Evaluation of Crosses for growth performance

Traits	***Jharsim* (E10)**	PB2 X Native (E7)
Egg wt 40 wks (g)	45.05±0.24	-
Age at first egg (d)	162	167
EP40 wks (Nos.)		
HD	36.57	31.88
HH	38.82	30.72
EP52 wks (Nos.)		
HD	82.56	66.03
HH	79.80	62.54
EP64 wks (Nos.)		
HD	141.03	117.14
HH	136.22	110.71
EP72 wks (Nos.)		
HD	177.03	141.37
HH	170.94	133.61

Implementation of STC component

TSP work was conducted in CD Block of Ranchi District; Mander and Angara block. One hundred (50 male and 50 female) tribal farmers of Koinardih, Lepsar Burhakuca, Singari, Kamati, villages of Chanho and Angara block selected for STC (TSP) work (Poultry farming) were provided three days training in 5 batches on poultry farm management at Ranchi Veterinary College. They were provided training material like, folder file, books on poultry and certificate for training. Fifty numbers of farmers of Chanho and Angara Block were provided 20 birds of 6-8 weeks age old after rearing at farm. They were provided with one chick feeder, one grower waterer, feed, medicine and vaccine along with birds.

Trainings conducted

77 farmers from different districts of Jharkhand have been provided individual training for 10 days and 4 groups (25 farmers each group) training of 100 farmers (3 days) on poultry farm and management. One exposure visit in Agro-tech Kisan mela 2023.

Germplasm Supply

Centre supplied 30,916 (3,256 hatching eggs and 27654 six-eight weeks) among 116 farmers, NGOs, KVKs and other agencies.

Revenue Generation

The centre generated receipt of Rs. 2.47 lakhs during the financial year which was 28.66% of the expenditure on feed cost (Rs.9.56 lakhs).

7 Control Populations, ICAR-DPR, Hyderabad (Telangana)

Activities assigned

• Maintenance and evaluation of random-bred control population for egg

• Maintenance and evaluation of random-bred control population for meat

• Supply of control population stocks to all AICRP centres except ICAR-CARI, Izatnagar.

Action taken

• The random-bred control populations for egg and for meat were regenerated.

• Hatching eggs from layer and meat control populations were made available to different AICRP centres during the year

Details of the implementation of programme and results achieved

I) Maintenance and evaluation of random bred control population for egg

A synthetic population that was originated from the AICRP and commercial populations at GAU, Anand was considered to be useful for this purpose and in the population available at Directorate of Poultry Research was under a mild positive selection for egg production. The selection was relaxed and mating was arranged among 70 randomly chosen males and 350 randomly chosen females to reproduce the base generation of the layer control LC-0. The LC-1 was reproduced with 60 sires and 300 dams in two hatches. The LC-2 generation was reproduced utilizing 40 sires and 200 dams in three hatches. The LC-4, LC-5, LC-6, LC-7 and L-8 generations were reproduced using 40 sires and 200 dams. LC-9 and LC-10 generation was reproduced using 32 sires and 128 dams and 37 sires and 74 dams, respectively. From LC-11 generation was reproduced with 50 sires and 200 dams. Recent generations were reproduced with 25 sires and 125 dams. The inbreeding coefficient was kept at minimum level. At the time of housing only two males per sire family and two females per dam family were housed for recording of production and other body weight traits according to the technical programme.

Regeneration of LC-16 generation: The number of sires and dams used to regenerate LC-16 generation, effective population size and rate of inbreeding are presented are presented in Table 1.

Table 1. Number of sires and dams, effective population size and rate of inbreeding over generations

Gen.	No. of Sires	No. of Dams	Effective population size (Ne)	Rate of in breeding (ΔF)
LC-7	40	200	133.33	0.00250
LC-8	40	200	133.33	0.00250
LC-9	32	128	102.40	0.00488
LC-10	37	74	98.66	0.00507
LC-11	50	200	160.00	0.00313
LC-12	50	200	160.00	0.003
LC-13	40	200	133.33	0.0025
LC-14	25	100	80.00	0.0062
LC-15	25	125	83.33	0.006
LC-16	25	125	83.33	0.0060

Incubation records

Incubation records of LC-16 generation in layer control population have been presented in Table 2. Fertility, hatchability on total eggs set and hatchability on fertile eggs set respectively were 78, 80 and 62%. Fertility and hatchability decreased in the current generation as compared to previous generation.

Production performance

During the year 2022-23, the 16th generation of layer control population (LC-16) was evaluated from 40 weeks to 72 weeks of age. The performance of control population and their regression value (time trend of control) has been presented in the following Table 3. The egg production up to 64 and 72 weeks of age was 217.25±1.91 and 250.2± 2.23 eggs, respectively with egg weights of 54.86± 0.23 and 56.20± 0.26g at respective age.

Table 2. Incubation records layer control population

Gen.	Fertility (%)	Hatchability (%)	
		FES	TES
LC-7	81.5	89.3	66.2
LC-8	78.5	91.6	71.9
LC-9	85.1	92.3	78.5
LC-10	70.2	84.2	59.1
LC-11	70.9	87.0	61.7
LC-12	62.0	85.0	53.0
LC-13	59.2	80.7	47.8
LC-14	81.0	82.0	68.0
LC-15	80.7	95.3	76.9
LC-16	78.0	79.6	62.1
b	**-0.47 NS**	**-0.76 NS**	**-0.58 NS**

Table 3. Performance of layer control population for growth and production traits

Gen.	Body weight (g)		ASM (days)	Egg weight	Egg production (Nos.)	
	16 wks	40 wks		40 wks (g)	40 wks	64 wks
LC-7	978	1511	148.1	50.90	93.13	189.1
LC-8	1010	1473	151.6	52.65	85.44	173.1
LC-9	1048	1510	154.9	52.91	91.47	200.7
LC-10	954	1508	155.4	53.28	92.64	194.4
LC-11	886	1497	156.4	51.28	94.90	223
LC-12	914	1522	150.1	52.88	98.00	224
LC-13	880	1492	150.6	51.11	107.69	221
LC-14	885	1624	155.0	52.43	97.74	217
LC-15	1087	1585	157.3	55.48	90.51	190
LC-16	984.1	1500	148.7	50.96	99.17	217.2
b	**-2.51 NS**	**7.46 NS**	**0.15 NS**	**0.08 NS**	**1.03 NS**	**3.23 NS**

The traits like body weight at 16 weeks of age, age at sexual maturity, 40 weeks egg weight and egg production to 40 weeks (up to LC-16) showed non- significant change and the control population appears to be stable for all the traits for last ten generations.

II) Maintenance and evaluation of random bred control population for meat

During the period G-21 generation of the control broiler was evaluated for juvenile traits and G-20 generation for production traits.

Incubation records

Incubation records of G-21 generation in broiler control population have been presented in Table 4. Percent fertility, percent hatchability on total eggs set and percent hatchability on fertile eggs set respectively were 91.90, 87.05 and 94.72. Fertility and hatchability (TES) were improved in the current generation as compared to previous generation.

Table 4. Incubation records Broiler control population

Gen.	Fertility (%)	Hatchability (%)	
		TES	FES
G-15	73.68	63.65	89.10
G-16	78.99	71.93	91.06
G-17	88.64	79.86	90.10
G-18	85.32	79.92	93.66
G-19	88.81	79.74	89.79
G-20	87.75	84.14	95.89
G-21	91.90	87.05	94.72

Juvenile body weights

Performance of juvenile traits in control broiler population in G-21 generation is presented in Table 5. During the current generation body weight at 5 weeks and 6 weeks of age were 810 and 975 g, respectively. After six weeks of age 500 female chicks and 150 male chicks representing all the sires and dams were saved and were being maintained under restricted feeding schedule. At the time of housing 2 males per sire family and 2 females per dam family were housed for recording of production traits. The regression estimates of generation mean on generation number for 5 weeks body weight and 6 weeks body weight showed non-significant changes over generations indicating the stability of the broiler control population for juvenile body weights.

Production traits

A total of 300 females were maintained till 40 weeks of age and recorded for age at sexual maturity, body weights at 20 and 40 weeks of age, egg weight at 32 and 40 weeks of age and egg production to 40 weeks of age. The mean for all these traits were presented in Table 6. The hatching eggs of this population were being supplied to the AICRP-PB centers as and when they require for evaluation of their selected lines. The consolidated production performance of broiler control over generations has been presented in the following Table 87. The regression estimates of generation means on generation number (G-0 to G-20) showed non-significant changes over the generations in all egg production and egg weight indicating the stability of the broiler control.

Table 5. Performance of juvenile body weights in broiler control population

Gen	BW 5 wks	BW 6 wks
G-1	822	1060
G-2	872	1141
G-3	731	995
G-4	897	1195
G-5	907	1106
G-6	672	891
G-7	592	783
G-8	929	1215
G-9	626	964
G-10	578	829
G-11	522	720
G-12	731	1156
G-13	573	993
G-14	520	663
G-15	570	836
G-16	734	951
G-17	740	930
G-18	755	1042
G-19	788	1056
G-20	842	1072
G-21	810	975
b	**-3.75^{NS}**	**-5.03^{NS}**

Table 6. Growth and production performance of broiler control population over the generations

Gen.	BW 20 wks (g)	BW 40 wks (g)	ASM (days)	EWT 32 wks (g)	EWT 40 wks (g)	EP 40 wks (No)
G-0	2509	3150	177	54.02	60.50	47.00
G-1	2536	3256	164	52.00	54.90	45.90
G-2	2776	3370	163	51.07	57.55	66.67
G-3	2670	3487	162	53.32	58.09	65.37
G-4	2591	3478	163	53.99	58.12	65.07
G-5	2559	3524	162	51.56	54.67	57.47
G-6	2130	2886	173	53.06	58.87	58.65
G-7	2457	3335	165	53.39	56.61	57.27
G-8	2436	3222	167	54.32	57.00	60.00
G-9	1941	3005	171	51.44	57.28	53.38
G-10	1982	2799	194	51.66	55.10	57.06
G-11	1885	2933	189	51.40	57.27	54.30
G-12	2369	3139	170	52.20	56.43	56.59
G-13	2279	3033	174	50.96	55.80	55.82
G-14	2416	3151	182	52.50	56.20	56.59
G-15	2296	3098	182	51.23	58.68	56.0
G-16	2474	2848	181	52.68	58.42	56.99
G-17	2222	2957	183	53.15	55.58	50.44
G-18	2197	2882	182	51.96	56.87	46.81
G-19	2535	3177	174	50.65	55.34	78.82
G-20	2526	3053	166	52.68	57.39	72.58
b	**-11.95** ^{NS}	**-19.86** **	**0.75***	**-0.06** ^{NS}	**-0.06**^{NS}	**0.28** ^{NS}

8 Critical Observations

KVASU, Mannuthy

Accomplishments and achievements

- The S-7 generation of native chicken was evaluated up to 28 weeks.
- The S-33 generation of IWN and IWP strains of White Leghorn was evaluated up to 72 weeks of age.
- The body weight recorded at 64 weeks of age was 1642.65 g and 1633.59 g in IWN and IWP strains (S-33), respectively.
- Hen-housed egg production up to 72 weeks of age was 295.82 and 286.32 in IWN and IWP strain, respectively. The hen-day egg production up to 72 weeks of age was 323.70 and 318.03, respectively and the survivors' egg production was 328.78 and 324.08, respectively in IWN and IWP strain of White Leghorn in S-33 generation.
- The egg weight at 64 weeks was 54.01 and 55.12g in IWN and IWP strains, respectively.
- The centre supplied a total of 68,220 numbers of germplasms during the year.
- The centre has generated revenue of Rs. 16.49 lakhs which is 120.87% of the recurring expenditure (feed cost Rs. 13.65 lakhs).

Short falls

- The mortality during 0-8 and 9-16 weeks in S-7 generation of native birds was above permissible level.
- Some suggestions made under critical observations in previous annual report are not incorporated.
- Germplasm supply needs improvement.

Suggestions for further improvement

- The incidence of mortality must be brought down with proper biosecurity measures.
- Age at 50% and age at peak production (%) must be given as instructed in previous annual report.
- The body weight of adult male birds of various breeds/ genotypes at 20 and 40 weeks must also be given.
- Selected (IWN and IWP) and Control population must be evaluated for production traits at the same time.
- Suggestions made under critical observations in the previous annual report must be looked into and necessary steps must be taken to implement them.

AAU, Anand

Accomplishments and achievements

- The S-3 generation of *Ankleshwar* chicken was evaluated up to 40 weeks of age and the S-4 generation of *Ankleshwar* chicken was produced and being evaluated.
- The S-3 generation of IWN and IWP strains was evaluated up to 40 weeks of age.
- The center has supplied a total of 43,146 germplasm during the reporting period.
- The center has generated the revenue of Rs. 29.08 lakhs during the reporting year which was 68.46% of the total expenditure of feed cost (42.48 lakhs).

Short falls

- Both germplasm supply and revenue generation have substantially decreased as compared to the previous year.
- The fertility and hatchability in IWP strain have come down in the present generation.
- The 40 weeks egg production in IWN strain and control population has come down as compared to the previous generation.
- Standard errors of heritability estimate of growth traits of IWN and IWP strains were high.
- Nil publications were made.

Suggestions for further improvement

- Effort must be made to improve the germplasm supply and revenue generation
- Age at 50% and age at peak production (%) may also

be given wherever possible.

- The body weight of adult male birds of *Ankleshwar* breed at 20 and 40 weeks must also be given.
- Under egg quality traits, the shape index must be studied and results must be explained in the report.
- Publications out of results of the centre in the form of research papers, technical articles, popular articles, etc. must be made.
- Suggestions made under critical observations in the previous annual report must be looked into and necessary steps must be taken to implement them.

KVAFSU, Bengaluru

Accomplishment and achievements

- Evaluated the performance of native chicken population (S-7), PB-1 (S-15) and PB-2 (S-28) for economic traits.
- Body weight of native chickens in S-6 generation at 8, 20 and 40 weeks of age was 254.6, 1082 and 1341g, respectively.
- Egg production (hen day) of native chickens in S-6 generation up to 40 and 72 weeks of age was 22.10 and 49.67 eggs, respectively.
- Body weights at 5 weeks of age in PB-1 and PB-2 lines was 1082 and 1017 g, respectively.
- PB-1 x PB-2 cross attained 1950 g at 7 weeks of age in field conditions.
- A total of 1,68,535 germplasms were supplied to 310 beneficiaries.
- The centre generated revenue of Rs. 44.37 lakhs which is 137.5% of expenditure on feed cost (Rs.32.26 lakhs).

Shortfalls

- There is a drastic decline in number of chicks produced in PB-1 and PB-2 lines.
- There is decline in egg production and egg weights in PB-1 and PB-2 lines.
- Control population was not simultaneously evaluated.
- The production of crosses for evaluation and developing new location specific variety was not undertaken during the period under report.
- No publications were made.

Suggestions for further improvement

- Process of developing of a new location specific variety needs to be given top priority.
- All efforts to be made to improve the juvenile growth and egg production performance in both parent lines.
- Publications from the results of the project needs to be made regularly.
- Suggestions made under critical observations in the previous annual report must be looked into and necessary steps must be taken to implement them.

GADVASU, Ludhiana

Accomplishment and achievements

- Evaluated the performance of *Punjab Brown* (S-7), PB-1 (S-15), PB-2 (S-47) and cross (PB-2 X Local) for economic traits.
- Body weight of *Punjab Brown* at 8 and 16 weeks was 669.1, 1512 and 633.3, 1408 g, respectively in male and female. Egg production up to 52 weeks was 110.7 eggs with egg weight of 50.72 g at 36 weeks of age.
- PB-2 x Native cross was evaluated for farm performance. The body weight at 4, 8 and 20 weeks of age were 366.3, 841.2 and 2,060 g, respectively. ASM and egg production up to 52 weeks was 170 days and 145 eggs, respectively.
- Average body weight at 5 weeks of age was 1190, 1094 and 887.6 g in PB-1, PB-2 and Control lines, respectively. Egg production up to 40 weeks of age in PB-1, PB-2 and Control lines were 65.14, 70.63 and 59.82 eggs, respectively.
- Genetic response over last 15 generations for 5 weeks body weight was 11.17 g in PB-1 and 4.42 g in PB-2 population.
- A total of 87,364 germplasms were supplied to 363 farmers.
- The centre generated revenue of Rs. 29.11 lakhs which was 116% of expenditure on feed cost (Rs. 25 lakhs).

Shortfalls

- Field evaluation of the cross was not undertaken during the period under report. Process of developing a new location specific variety needs to be given top priority.
- There is reduction in the body weight at 5 weeks of age in PB-1 and PB-2 lines.

- The body weight of PB-1 and PB-2 lines at 20 weeks of age needs to be maintained between 2150-2200 g for realizing the optimum production during laying phase.
- No publications were made.

Suggestions for further improvement

- Field evaluation of dual purpose cross needs to be undertaken.
- Process of developing of a new location specific variety needs to be given top priority.
- Centre needs to implement and monitor the feed restriction program to maintaining the required body weight at 20 weeks of age.
- Publications from the results of the project needs to be made regularly.
- Suggestions made under critical observations in the previous annual report must be looked into and necessary steps must be taken to implement them.

OUAT, Bhubaneswar

Accomplishment and achievements

- *Hansli* chicken was evaluated for juvenile traits in S-1 generation. Body weight at 8 and 20 weeks of age was 603.2.6 and 1583 g, respectively in *Hansli*.
- The hen day egg production at 40 and 52 weeks of age were 25.22 and 34.36 eggs in *Hansli*.
- The average body weight at 5 weeks of age was 1018 and 1123 g in CSFL and CSML, respectively in G-1 generation.
- In CSFL and CSML lines, the egg production up to 40 weeks was 64.31 and 61.55 eggs, respectively.
- The centre supplied 7,827 numbers of germplasms to farmers (371 numbers) and generated revenue of Rs.1.40 lakhs.

Shortfalls

- Population size of native germplasm is low.
- Germplasm supply was low.
- The number of chicks evaluated for juvenile traits in CSML and CSFL lines was very low.
- The production of crosses for evaluation and developing new location specific variety was not undertaken during the period under report. This needs to be given top priority.

Suggestions for further improvement

- Population of native germplasm needs to be strengthened.
- It is suggested to evaluate a greater number of chicks for juvenile traits in CSML and CSFL lines.
- Proper biosecurity measures need to be maintained.
- Germplasm supply needs to be improved.
- Suggestions made under critical observations in the previous annual report must be looked into and necessary steps must be taken to implement them.

ICAR-CARI, Izatnagar

Accomplishment and achievements

- Evaluated the performance of native (S-7), CSML (S-20), CSFL (S-20) and CSML X Native cross.
- The body weight at 5 weeks increased in CSML and decreased in CSFL lines as compared to previous generation.
- The hen housed egg production up to 40 weeks in CSML, CSFL and control lines was 67.18, 68.40 and 56.50 eggs, respectively during S-19 generation
- A total 16,138 germplasm was supplied to the 23 farmers.
- The centre generated the revenue of Rs.17.69 lakhs.

Shortfalls

- Juvenile bodyweight, growth and egg production performance of native germplasm was not reported.
- Production performance of the cross was not evaluated.
- Mortality details in elite lines, native and cross were not reported.
- The selection differential and expected response details were not provided. Genetic parameters of trait under selection was also not provided.
- Germplasm supply was low.
- Number of observations in growth and production traits were not given.
- Suggestions from the last year's critical observations were not incorporated.
- No publications were made.

Suggestions for further improvement

- Process of developing of a new location specific variety needs to be given top priority.
- Farm and field evaluation of the cross for growth and egg production need to be carried out.
- Growth and egg production performance of native and cross needs to be reported.
- Mortality details in elite lines, native and cross needs to be reported.
- Genetic parameters may be estimated and presented for important traits.
- Efforts should be made for proper reporting of results in the annual report.
- Efforts should be made to improve the germplasm supply.
- Suggestions made under critical observations in the previous annual report must be looked into and necessary steps must be taken to implement them.

ICAR Research Complex, Agartala

Accomplishments and achievements

- The Tripura centre evaluated the *Tripura black, Dahlem Red*, Coloured Synthetic Female Line (CSFL), BN cross and BND cross.
- Three-way cross was evaluated in E-6 generation up to 72 weeks of age and E-7 generation up to 52 weeks of age.
- Egg production of BND cross up to 72 weeks of age was 159.3±2.99 eggs in farm and 138.8 eggs in field conditions.
- During the period, a total of 19,081 germplasm was supplied to 623 farmers of Tripura.
- The centre realized overall the receipt of Rs. 10.70 lakhs which was 114.4% of the expenditure on feed cost (Rs. 9.35 lakhs).

Short falls

- Mortality during 0 to 6 weeks of age in all the germplasm and 7 to 20 weeks in BN cross was high.
- The information on number of sires and dams used to produce the population of *Tripura Black*, number of sires and dams contributed the progenies to the next generation, rate of inbreeding, etc. is not provided in the report.
- Age at 50% and age at peak production (%) is not given as suggested previously.
- Both germplasm supply and revenue generation have come down in this year as well.
- No publications were made.

Suggestions for further improvement

- Necessary steps must take to reduce the mortality in the populations.
- As sex wise body weight of adult birds (Hens and cocks) is given in the report, there is no need to give body weight on pooled sex at these ages in the tables.
- Egg weights at 52 and 72 weeks of age also needs to be recorded as suggested in the previous year.
- Efforts must be made to increase both germplasm supply and revenue generation of the centre.
- Suggestions made under critical observations in the previous annual report must be looked into and necessary steps must be taken to implement them.

NDVSU, Jabalpur

Accomplishments and achievements

- The centre maintained *Kadaknath*, *Jabalpur colour* and *Kadaknath* cross populations.
- During the current year centre evaluated G-2 generation of *Kadaknath* and *Jabalpur colour* population from 7 weeks to 72 weeks age.
- The *Narmadanidhi* commercial birds were evaluated under farm and field conditions up to 72 weeks age.
- A total of 34,978 chicken germplasm was distributed to 440 farmers.
- The centre realized a receipt of Rs. 14.69 lakhs which was 121% of the expenditure on feed cost (Rs. 12.06 lakhs).

Short falls

- Both germplasm supply and revenue generation have substantially decreased as compared to the previous year.
- No survivors egg production was given for the Jabalpur colour and *Kadaknath* populations.
- Editing and presentation of annual report needs lot of improvement.
- None of the suggestions made in the previous year

were incorporated in this year's report.

- No publications were made.

Suggestions for further improvement

- Age at 50% and age at peak production (%) may be given wherever possible.
- Survivors' egg production must be given for the Jabalpur colour and *Kadaknath* populations.
- Due diligence must be made in the preparation and presentation of annual report.
- No need to repeat or present the data which is already given in tables in text.
- Egg weights at 52 and 72 weeks of age also needs to be recorded if egg production is being evaluated up to 72 weeks of age.
- Present the shank length and keel length in mm not in cm.
- Suggestions made under critical observations in the previous annual report must be looked into and necessary steps must be taken to implement them.

MPUAT, Udaipur

Accomplishments and achievements

- G-12 generation of *Mewari* breed was evaluated up to 52 weeks of age.
- *Pratapdhan* was evaluated for production traits up to 72 weeks of age during E11 generation.
- RIR and CSFL populations were regenerated and being maintained at the centre
- Four research papers were published during the report period.
- A total of 41,836 improved chicken germplasm was distributed to about 769 farmers during the current year.
- The centre realized a receipt of Rs.12.09 lakhs during the current financial year, which was 89.09% of the expenditure on feed cost (Rs 13.57 lakhs).

Short falls

- The details of the breeding population of *Mewari* breed was not given.
- Egg weights at 72 weeks of age was not given.
- Germplasm supply was low.

Suggestions for further improvement

- Detailed information on breeding methods used in different germplasms in each generation/year needs to be given.
- Age at 50% and age at peak production (%) was not given despite the suggestion.
- Egg weights at 72 weeks of age also needs to be recorded as the egg production is being recorded up to 72 weeks.
- The body weight of adult male birds of various breeds/genotypes at 20 and 40 weeks as suggested previously must also be given.
- Suggestions made under critical observations in the previous annual report must be looked into and necessary steps must be taken to implement them.

CSKHPKVV, Palampur

Accomplishments and achievements

- *Himsamridhi,* a location specific variety suitable for backyard poultry farming in hilly areas is being propagated.
- In native chickens, G-10 generation was evaluated up to 40 weeks of age, while G-9 generation from the previous year completed evaluation from 41 weeks to 72 weeks of age.
- The *Dahlem Red* population (G-9) evaluated up to 52 weeks of age, while G-8 generation completed evaluation from 41 weeks to 52 weeks of age
- The chicks of *Himsamridhi* (DND) have been produced and evaluated at farm and field conditions up to 52 weeks for growth and production parameters.
- The centre supplied a total of 60,149 chicks to farmers in different regions of the state including far flung tribal areas.
- The centre realised the receipts of Rs 27.32 lakhs which was 90.92% of expenditure on feed cost (Rs. 30.05 lakhs) during the current year.

Short falls

- No information is given about number of sires and sex ratio used (Sire:Dams) used for the regeneration of the native chickens and determination of heritability.
- Germplasm supply has come down this year as compared to the previous year.

- There are no standard errors for age at sexual maturity (ASM).
- It is mentioned in the Table 3 and Table 4 that body weight was recorded on pooled sex up to 40 weeks of age. If that is the case, the sex wise body weight of adult (hens and cocks) birds at 20 and 40 weeks must also be given.

Suggestions for further improvement

- Age at 50% and age at peak production (%) is not given despite the suggestion made in previous year.
- Egg weights at 72 weeks of age also needs to be recorded as egg production is being recorded up to that age as suggested previously.
- Standard errors for age at sexual maturity (ASM) must be given as suggested previously.
- The sex wise body weight of adult (hens and cocks) birds at 20 and 40 weeks must be recorded and presented in the report.
- It must be noted that there is a difference in AFE in the flock and average AFE of all hens (ASM) of the population and give only AFE, age at 50% production and age at peak production as data collection on egg production at individual bird level not possible under field conditions.
- Suggestions made under critical observations in the previous annual report must be looked into and necessary steps must be taken to implement them.

AAU, Guwahati

Accomplishments and achievements

- *Daothigir*, native chicken (ND), *Dahlem Red*, PB-2 and *Kamrupa* birds were maintained and evaluated for growth and production traits.
- The centre supplied 26,874 (4572 hatching eggs and 22302 chicks/growers of *Kamrupa*) germplasm to 250 farmers.
- The centre realized receipt of Rs. 6.16 lakhs during the financial year which is 26.0% of expenditure on feed cost (Rs. 23.70 lakhs).

Short falls

- Germplasm supply has come down as compared to the previous year.
- No standard errors were given for the hen housed and survivors' egg production of *Daothigir*, native *Dahlem Red* and crosses.
- It is not clear whether the body weight of *Daothigir* breed at 20 and 40 weeks of age is of female birds or pooled sex.
- No publications were made.
- It is not mentioned whether the pedigreed populations to native chickens and *Daothigir* was maintained.

Suggestions for further improvement

- Germplasm supply needs to be improved.
- Age at 50% and age at peak production (%) is not given despite the suggestion made in previous year.
- The sex wise body weight of adult (hens and cocks) birds of all germplasm at 20 and 40 weeks must be recorded and presented in the report. (The repeated suggestion).
- The pedigreed population of native chickens and *Daothigir* needs to be maintained and evaluated.
- Suggestions made under critical observations in the previous annual report must be looked into and necessary steps must be taken to implement them.

BAU, Ranchi

Accomplishments and achievements

- The centre evaluated G-10 generation of native chicken population up to 72 weeks of age and G-11 generation up to 4 weeks of age. The G-10 generation of *Dahlem Red* was evaluated up to 64 weeks of age.
- Evaluation of *Jharsim* (E10) up to 72 weeks of age and E11 up to 4 weeks of age under farm conditions.
- The centre has supplied 30,916 *Jharsim* chicks among 116 farmers, NGOs, KVKs and other agencies.
- The centre realised a revenue of Rs. 2.47 lakhs during the financial year which was 28.66% of the expenditure on feed cost (Rs.9.56 lakhs).

Short falls

- The performance evaluation of *Jharsim* at field condition was not done despite repeated suggestions since last six years.
- Germplasm supply has further comedown.

- Egg weight of *Dahlem Red* (G-9) at 40 weeks of age is not provided.
- Standard errors for production traits of native chickens and *Dahlem Red* breeds were not given (Table 3).
- No publications were made.
- Reporting of the results is very poor.
- The 72 weeks egg production of native chickens in G- 10 generation has come down as compared to the G-9 generation.
- The overall performance of the Ranchi centre as reflected in the achievements since last few years including this year is not satisfactory.

Suggestions for further improvement

- As suggested since last several years the centre needs to improve the overall performance.
- Germplasm supply of the centre needs improvement.
- Presentation of data and results must be improved.
- Suggestions made under critical observations in the previous annual report must be looked into and necessary steps must be taken to implement them.

9 Poultry Seed Project

History

India is an agri-based country with more than 65% population living in rural areas, who mainly depends on agriculture and livestock farming for their livelihood. The intensive poultry farming largely depends on expensive inputs like feed ingredients, healthcare products, power and manpower and has grown to an agri-based industry providing employment to 5-6 million people. Therefore, the intensive farming is limited to a few urban pockets in our country, which resulted in wide gap in availability of poultry produce (eggs & chicken meat) between urban and rural areas across the country. The poultry products are available relatively at cheaper price in abundance in production centres and at higher price in rural areas which resulted in wide gap in per capita consumption between urban and rural areas. Logically, there is a great need for protein rich food in the diets of rural population. Majority of rural families in our country consume rice or wheat as staple food, which is rich in energy and low in protein. Therefore, there is a great need for balanced protein for rural population to safe guard their health. Egg and chicken meat are less expensive and can be made readily available to enrich the low protein diets of rural / tribal population by adapting rural poultry farming.

Directorate of Poultry Research has developed three promising chicken varieties, *Vanaraja*, *Gramapriya* and *Srinidhi* which are popular for their better growth and production than the native chicken in the rural and tribal areas. All these birds gained wider acceptability in almost all states of the country. Due to the limited facilities available with the Directorate for supply of these chicken varieties across the country and also difficulties involved in transportation of chicks and fertile eggs throughout the country, necessity was felt to establish rural chicken germplasm multiplication units across the country.

Indian Council of Agricultural Research initiated the Poultry Seed Project with a sole aim to provide the improved chicken varieties to all parts of the country through collaborative efforts involving state agricultural/veterinary universities, line departments and ICAR institutes. Six centres were sanctioned in XI plan and further strengthened in XII plan by adding another five centres. During the present EFC three centres were added and two centres were discontinued from 2017-18.

Objectives

- Production of around 0.3-1.0 lakh improved poultry seed per identified centre/state per annum to distribute them in respective areas.
- Capacity building in SAUs/ICAR Institutes to produce poultry seed at each centre on its own.

Centres

Considering the advantages of establishing seed (fertile eggs / chicken) multiplication units, the Indian Council of Agricultural Research has initiated and sanctioned "Poultry Seed Project" during the XI five-year plan. Initially six centres were sanctioned, three in the NE region and three in the main land and further strengthened with five more centres during XII plan as indicated below. One non-funded centre has also been started during the XII plan which was made regular centre from 2017-18

Table 1. Centres in operation under Poultry Seed Project

S.No	Centre	State
1	Bihar Animal Sciences University, Patna	Bihar
2	West Bengal University of Animal and Fishery Sciences, Kolkata	West Bengal
3	ICAR Research complex for NEH Region, Nagaland Centre, Jharnapani	Nagaland
4	ICAR Research complex for NEH Region, Sikkim Centre, Gangtok	Sikkim
5	ICAR Research complex for NEH Region, Manipur Centre, Imphal	Manipur
6	Tamil Nadu Veterinary and Animal Sciences University, Hosur	Tamil Nadu
7	ICAR-Central Coastal Agricultural Research Institute, Panaji	Goa
8	ICAR-Central Island Agricultural Research Institute, Port Blair	A & N Islands
9	PVNR Telangana Veterinary University, Warangal	Telangana
10	Sri Venkateswara Veterinary University, Tirupati	Andhra Pradesh
11	Sher-e-Kashmir University of Agricultural Sciences and Technology, Srinagar	Jammu & Kashmir
12	ICAR Research Complex for NEH Region, Umiam	Meghalaya

10 Technical Program

- Technical program envisaged for all the centres is same except for the target of supplying chicks/fertile eggs.
- All the centres will procure parents (males of male line and females of female line) of improved chicken germplasm (*Vanaraja*, *Gramapriya* and *Srinidhi*) from the ICAR-Directorate of Poultry Research, Hyderabad. Day old parent chicks will be reared under standard management practices as per guidelines provided in the breeder manual supplied by the Directorate at the respective centre.
- Adult male and female birds will be reared to produce fertile hatching eggs. Day old chicks of the improved germplasm will be hatched and will be reared in the nursery unit or sold to NGOs/ KVKs/farmers for nursery rearing up to 6 weeks of age. The chicks in the nursery unit will be provided with feed, medication, vaccination, brooding, and health care. After the nursery phase, the chicks will be distributed to the individual farmers on cost basis. Wherever possible, the day old chicks / fertile eggs of improved chicken varieties may be distributed to the individual farmers / extension agency / NGO / KVK, who has the facility to grow the birds up to 6 weeks of age in the nursery unit. These birds may be further distributed to the individual farmers at the rate of 10-15 birds per person.
- To know the performance of the birds at farmer's field recording of body weight at 4 weeks intervals during growing (7-20 weeks). Egg production and egg weight at every 14 day intervals during egg laying period (21-72 weeks) will be recorded.
- Analysis, documentation and reporting of the data at regular intervals.

Table 1. Targets for germplasm supply for different centres

S.No	Centre	Target (nos.)	Achievement
1	Bihar Animal Sciences University, Patna	50,000	55,367
2	West Bengal University of Animal and Fishery Sciences, Kolkata	1,00,000	--
3	ICAR Research complex for NEH Region, Nagaland Centre, Jharnapani	70,000	61,368
4	ICAR Research complex for NEH Region, Sikkim Centre, Gangtok	60,000	56,485
5	ICAR Research complex for NEH Region, Manipur Centre, Imphal	60,000	12,420
6	Tamil Nadu Veterinary and Animal Sciences University, Hosur	1,00,000	54,708
7	ICAR-Central Coastal Agricultural Research Institute, Panaji, Goa	50,000	22,733
8	ICAR-Central Island Agricultural Research Institute, Port Blair, A & N Islands	50,000	10,023
9	PVNR Telangana Veterinary University, Warangal	50,000	50,709
10	Sri Venkateswara Veterinary University, Tirupati	50,000	8,396
11	Sher-e-Kashmir University of Agricultural Sciences and Technology, Srinagar	50,000	21,466
12	ICAR Research Complex for NEH Region, Umiam	50,000	17,744
	Total		**3,71,419**

11 Performance appraisal of PSP centres

Bihar Animal Sciences University, Patna (Bihar)

Activities assigned

- Maintenance of parent stock for continuous supply of fertile eggs, day old and grown up chicks of rural chicken varieties.
- Recording the growth, production, fertility and hatchability in parents.
- Collection of data on growth and production parameters from farmers' fields.
- Analysis, documentation and reporting of the data.

Work done

Parent Stock

During the period under report 150 male and 1080 female day old chicks of *Vanaraja* have been procured from DPR, Hyderabad out of which 99 male and 674 female birds were present as on 31.03.2023. The average body weight of the birds at different weeks of age is given in Table 1.

Table 1. Body weight (g) of parent lines at different weeks of age (Batch-XIII)

Age (wks)	Male	Female
0–day	44.92±0.51	33.09±00.55
2	168.26±4.32	146.38±02.69
4	376.32±9.95	379.48±08.34
6	592.18±12.82	723.38±12.16
8	1078.02±28.24	775.66±20.25
10	1283.50±64.11	1034.12±28.81
12	1498.88±42.41	1165.78±22.77
14	1721.31±43.64	1541.52±23.79
16	1954.70±54.92	1675.86±36.54
18	2122.40±42.82	1739.82±32.34
20	2344.51±62.90	1783.35±40.14
22	2558.42±67.71	1845.46±36.58
24	2752.50±54.22	1942.37±43.34
26	2932.64±62.40	2054.27±47.82
28	3273.72±66.42	2374.57±22.56
30	3388.78±43.22	2477.32±33.62
32	3495.08±78.33	2489.39±29.66
34	3578.28±66.96	2533.18±33.68
36	3684.67±29.39	2539.22±36.72
38	3696.90±84.62	2544.24±43.55
40	3708.44±41.22	2549.42±47.65
42	3753.66±49.55	2554.62±33.78
44	3784.50±38.33	2566.69±44.86
46	3833.23±51.88	2569.72±54.89
48	3878.46±56.92	2573.78±58.91
50	3889.58±60.59	2578.86±62.94
52	4007.03±09.13	2605.54±52.18
54	4038.09±03.33	2612.58±61.23
56	4066.77±16.24	2617.78±69.29
58	4089.86±33.36	2630.82±71.38
60	4096.89±36.53	2638.85±73.46
62	4117.55±42.57	2644.87±78.52
64	4136.67±22.78	2734.77±58.62

Egg production and Egg weight

The average age of first egg lay at 3% egg production 182 days of age in *Vanaraja* Parent Stock of Batch-XIII. The average age at 10% egg production of was recorded to be 194 days. A total of 73093 eggs were produced. The bi-weekly hen-day egg production percent of *Vanaraja* parents is presented in the Table 2. The bi-weekly egg weight of *Vanaraja* parents batch –XIII have been presented in Table 2.

Table 2. Biweekly hen-day egg production and egg production of *Vanaraja* parent stock

Age (wks)	Batch XIII		
	Egg production	Hen day egg production (%)	Egg weight (g)
24	46	1.06	42.36±0.25
26	254	7.02	42.42±0.62
28	662	11.23	43.08±0.68
30	1175	17.36	43.27±0.71
32	1359	26.38	44.33±0.74
34	1389	29.44	44.43±0.76
36	1422	34.48	45.55±0.69
38	1486	36.52	55.59±0.73
40	1578	39.58	55.68±0.79
42	1596	42.60	56.71±0.84
44	1688	44.38	56.88±0.89
46	1692	46.66	57.46±0.61

A total of 68,881 eggs were set in the incubator during the period under report and total 50,869 day old chicks were produced. Fertility of *Vanaraja* birds was 76.57%. Hatchability on TES and FES for *Vanaraja* was 68.91% and 82.67% respectively, during the current period.

Germplasm supply and Revenue Generation

A total of 55367 commercial chicks were distributed during the period under report. Total number of farmers benefited is 1750. Most of the agency/farmers usually prefer to take grown up chicks after completion of brooding stage however farmers are required to be convinced to take day old chicks. Nursery birds at the age of 5-6 weeks were distributed among the farmers through various agencies like ATMA and KVKs to promote backyard poultry farming in the state. Birds were distributed through KVKs and NGOs. Birds were also distributed among the farmers through Agricultural Technology Management Agency (ATMA) in the Naxalite affected areas of Jehanabad and Gaya districts. Demonstration and training programmes were organized by the PSP, BVC, Patna with the help of ATMA for adoption of this project among the farming community. Birds have also been supplied to the farmers of Chatra, and Hazaribagh district in Jharkhand. A sum of total Rs. 18,80,751was generated through sale of commercial chicks and fertile eggs.

ICAR Research Complex for NEH Region, Nagaland Centre, Jharnapani (Nagaland)

Activities assigned

- Maintenance of parent stock for continuous supply of fertile eggs, day old and grown up chicks of rural chicken varieties.
- Recording the growth, production, fertility and hatchability in parents.
- Collection of data on growth and production parameters from farmers' fields.
- Analysis, documentation and reporting of the data.

Work done

Parent Stock

During the reporting year one batch of parent stock of *Vanaraja* and *Srinidhi* was procured and maintained under deep litter system. The weekly body weight and the mortality pattern was recorded and presented below.

Egg production

The hen house egg production performance is mentioned on weekly basis for *Vanaraja* and *Srinidhi* parent line in Table 4.

Table 3. Body weight (g) records of *Vanaraja* and *Srinidhi* parent line

Age (wks)	*Vanaraja* male XIV	*Vanaraja* female XIV	*Srinidhi* male VIII	*Srinidhi* female VIII
Initial	31.5±1.5	32.73±1.15	39.63±1.11	34.72±0.65
1	109.75±2.47	80±1.84	108.43±2.66	56.25±1.01
2	136.25±2.40	108.67±3.08	186.76±4.85	66.62±1.76
4	218.5±6.28	175.8333±5.75	438.97±13.06	197.12±7.25
6	326.75±9.76	324.5±8.99	568.64±14.05	203±6.40
8	670.25±13.99	488±9.73	-	-
10	1132.62±45.24	685.37±17.48	169.34±43.89	379.5±12.59
12	1360.62±34.60	1116.25±55.29	1185.34±47.60	581±14.07
14	1733.62±65.39	1275.25±31.27	1693.97±63.74	688.62±20.77
16	2135.12±38.19	1439±38.78	1964.64±70.15	900.75±23.74
18	2325.62±51.24	1677.62±32.55	2386.96±73.62	1130.75±18.72
20	2772.81±50.53	1791.87±32.95	2806.43±84.07	1187.12±22.11

Table 4. Egg production (HHEP%) in parents of *Vanaraja and Srinidhi*

Age (wks)	*Vanaraja* (Batch-XIV)	*Srinidhi* (Batch-VIII)
28	10.30	7.35
32	29.29	60.00
36	14.58	64.45
40	46.89	62.92
44	49.10	61.68
48	48.38	-
52	45.74	-

Hatching performance

The average fertility was 83.60% and hatchability on TES and FES were 67.05% and 79.90% respectively in XIV batch of *Vanaraja* parents. The average fertility was 84.59% and hatchability on TES and FES were 65.47% and 77.37% respectively, in VIII batch of *Srinidhi* parents.

Germplasm supply and Revenue Generation

During the reporting year, total germplasm supplied was 61,368 numbers (59910 no. of chicks, 345 fertile eggs and 1062 adult birds) to 847 beneficiaries including farmers, KVKs, NGOs working in Nagaland and neighbouring states and different state/central sponsored program. Several capacity building programs were undertaken to popularize the *Vanaraja* and *Srinidhi* poultry varieties for backyard farming in Nagaland. Under the Tribal Sub Plan, a total no. of 538 beneficiaries were covered from Noklak, Kiphire, Kohima, Peren, Dimapur, Mon, Mokokchung and Phek districts in Nagaland and altogether 15273 nos. of Day old chicks and grown up chicks of *Vanaraja* and *Srinidhi* varieties were provided to the beneficiaries. The performance of *Vanaraja* birds under field condition was appraised from the demonstration unit established in previous year and obtained encouraging results. A total of Rs 34,08,915/- revenue generated through sale of chicks and eggs during the period.

Constraints

- Urgent requirement of another Setter and Hatcher, as there is only one setter which when malfunctions creates inconveniences.
- Requirement of incinerator for disposal of hatchery wastes.
- Higher rate of chick mortality during winter season.

ICAR Research Complex for NEH Region, Sikkim Centre, Gangtok (Sikkim)

Activities assigned

- Maintenance of parent stock for continuous supply of fertile eggs, day old and grown up chicks of rural chicken varieties.
- Recording the growth, production, fertility and hatchability in parents.
- Collection of data on growth and production parameters from farmers' fields.
- Analysis, documentation and reporting of the data.

Work done

Parent Stock

The 13th batch of 1570 (males:180 and females:1390) *Vanaraja* parents were reared up to 28 weeks during the 2022-23. The body weight of male and female parents of *Vanaraja* up to 25 weeks of age is given in below Table 5. The egg production was recorded in 12th batch up to 72 weeks of age.

Table 5. Body weight (kg) of *Vanaraja* parents-13th Batch

Age (wks)	Total Birds (Nos.)	Body Weight (g)	
		Male	Female
1	1355	0.049	0.047
2	1337	0.135	0.122
3	1335	0.187	0.146
4	1335	0.275	0.210
5	1323	0.345	0.277
6	1322	0.446	0.344
7	1321	0.515	0.485
8	1314	0.645	0.553
9	1312	0.671	0.642
10	1289	0.818	0.761
11	1280	0.955	0.826
12	1264	1.015	0.896
13	1259	1.053	1.016
14	1251	1.080	1.023
15	1248	1.113	1.098
16	1234	1.290	1.131
17	1227	1.393	1.183
18	1213	1.419	1.191
19	1196	1.590	1.320
20	1193	1.700	1.328
21	1192	1.815	1.413
22	1187	2.010	1.560
23	1183	2.040	1.580
24	1179	2.105	1.599
25	1178	2.144	1.620

Egg production

The average HDEP in *Vanaraja* female parent of batch 12th is given below in Table 6.

Table 6. Egg production (%) in *Vanaraja* parent birds

Age (wks)	Hen day egg (%)	HDEP Range	Egg weight (g)
25	0.37		36
26	2.59	0.93-2.59	37.28
27	13.70	1.85-13.70	42.9
28	28.25	14.63-28.25	45.55
29	49.81	29.18-49.81	47.43
30	60.75	49.35-60.75	49.36
31	65.28	57.41-65.28	50.21
32	68.56	63.77-70.27	52.28
33	59.81	59.81-68.37	54.85
34	63.71	64.49-67.75	55.54
35	63.28	58.41-63.71	55.91
36	65.81	58.59-65.81	56.22
37	56.83	56.32-60.47	57.10
38	57.77	54.85-62.38	57.67
39	50.10	50.10-62.78	58.03
40	64.44	56.65-64.44	57.74
41	64.71	62.07-64.71	58.44
42	67.01	61.79-70.47	58.73
43	65.64	62.32-74.34	58.61
44	69.06	67.21-72.13	58.94
45	69.14	68.24-70.49	59.88
46	70.72	61.86-70.78	60.75
47	64.86	62.73-67.22	60.92
48	69.46	61.12-69.46	60.87
49	64.44	62.13-67.36	61.15
50	50.95	50.95-64.23	61.79
51	61.28	49.69-61.28	62.33

Age (wks)	Hen day egg (%)	HDEP Range	Egg weight (g)
52	57.00	55.22-65.46	62.87
53	43.75	43.75-63.09	63.19
54	20.74	20.00-41.47	62.79
55	36.95	21.66-36.95	63.45
56	38.00	34.29-41.81	64.23
57	39.15	39.15-47.66	64.96
58	39.78	37.22-45.29	65.10
59	36.05	36.05-44.02	65.83
60	37.39	37.30-44.39	66.42
61	37.38	34.27-38.28	66.28
62	34.60	34.12-37.62	66.64
63	26.97	26.25-33.33	66.34
64	25.06	20.53-30.07	63.45
65	19.57	19.57-27.45	63.70
66	20.81	17.90-23.15	64.23
67	21.53	14.83-23.21	65.77
68	24.04	19.42-25.48	66.18
69	26.57	20.24-28.74	67.53
70	39.13	27.29-39.13	65.11
71	54.37	37.44-54.37	65.30
72	52.57	47.82-55.96	64.66

Hatching performance

The average fertility was 89.17% and hatchability (TES) was 71.50% in *Vanaraja* female line parents (12th Batch).

Germplasm supply and Revenue Generation

A total of 56,485 chicks were supplied to during the period in which 43,224 chicks were supplied under Tribal Sub Plan. There were 383 villages covered and 1761 farmers benefited through the center during the period. Out of the total beneficiaries 1719 were tribal farmers. An amount of Rs. 14,01,508/- revenue was generated by supplying germplasm during the period.

Constraints

No constraints were reported in the period.

ICAR Research Complex for NEH Region, Manipur Centre, Imphal (Manipur)

Activities assigned

- Maintenance of parent stock for continuous supply of fertile eggs, day old and grown up chicks of rural chicken varieties.
- Recording the growth, production, fertility and hatchability in parents.
- Collection of data on growth and production parameters from farmers' fields.
- Analysis, documentation and reporting of the data.

Work done

Parent stock

During the reporting year one batch of parent stock of *Vanaraja* and *Srinidhi* were procured and maintained under deep litter system. The present 17th batch parent stock was received during August 2022 and started laying from the last week of February, 2023. The average body weight was recorded at every four weeks till 34 weeks of age was recorded and presented in Table 7.

Hatching Performance of birds

The fertility was 81.27 and 80.56% in *Vanaraja* and *Srinidhi* parents, respectively. The hatchability on TES and FES was 49.96 and 61.47% in *Vanaraja* and 53.63 and 66.62% in *Srinidhi* parents.

Germplasm Supply and Revenue Generation

During the current year 12,420 chicks were supplied to different parts of the state. Revenue generated was Rs.14,61,345 (14,33,095/- for sale of chicks + Rs 28,250/- for sale of unproductive birds) during the reporting time.

Field performance and Feedback from the farmers

The performance data of *Vanaraja* and *Srinidhi* birds under farmer's field were collected from the farmers randomly. The production record and performance of birds in various parts of the Manipur District in terms of their body weight gain, feed efficiency, egg weight and shank length in field condition was recorded. Along with the birds, other requirements like feed, medicine and feed supplement were also given to the beneficiaries. The main reason of mortality during initial phase in farmer's field was due to irregular or insufficient electricity supply which is required for brooding of chicks and disease like coccidiosis, respiratory infection and endo-parasite infestation and a higher rate of disease incidence was also observed where the beneficiaries did not follow the timely health cover and maintained properly.

Table 7. Body weight (g) of *Vanaraja* and *Srinidhi* parents at different ages

Age (wks)	*Vanaraja* (17th batch)		Age (wks)	*Srinidhi* (17th batch)	
	Male line	Female line		Male line	Female line
4	180.6±5.35	122.2±4.00	4	140.6±5.35	102.2±4.00
8	553.4±5.52	337.0±2.72	8	453.4±5.52	237.0±2.72
10	792.2±9.17	454.2±3.12	12	722.2±9.17	414.2±3.12
14	1003.0±6.71	875.6±2.54	16	983.0±6.71	775.6±2.54
18	1571.6±7.88	1405.0±2.21	20	1480.6±7.88	1385.0±2.21
22	2007.8±9.94	1800.2±8.74	24	2066.8±9.94	1720.2±8.74
26	2375.6±8.73	2010.0±8.08	28	2360.6±8.73	2010.0±8.08
30	2453.0±7.11	2200.0±6.91	32	2468.0±7.11	2100.0±6.91
34	2725±10.18	2310±9.29	36	2790±10.18	2110±9.29

Table 8. Average body weight (g) of *Vanaraja* and *Srinidhi* birds at different ages in field

Parameters	*Vanaraja*		*Srinidhi*	
Age (wks)	Male Average Body Weight (g)	Female Average Body Weight (g)	Male Average Body Weight (g)	Female Average Body Weight (g)
4	356.43	312.32	328.54	248.43
8	886.13	689.36	823.41	574.65
12	1452.65	876.76	1476.42	866.32
16	1764.68	1377.56	1702.56	1156.47
20	2575.63	1672.01	1865.25	1137.56

Table 9. Performance parameters of *Vanaraja* and *Srinidhi* birds in field

Parameters	*Vanaraja*		*Srinidhi*	
	Male	Female	Male	Female
Egg weight(g)	-	55.6	-	54.2
Shank length (cm)	8.5	7.3	8.2	5.7

Constraints

The present 17th batch parent stock was received during August 2022 and started laying from the last week of February, 2023 and chick production was low.

Since the incubator is old, there is problem faced in operating the machine which needs constant repairing from time to time.

Tamil Nadu Veterinary and Animal Sciences University, Hosur (Tamil Nadu)

Activities assigned

- Maintenance of parent stock for continuous supply of fertile eggs, day old and grown up chicks of rural chicken varieties.
- Recording the growth, production, fertility and hatchability in parents.
- Collection of data on growth and production parameters from farmers' fields.
- Analysis, documentation and reporting of the data.

Work done

Parent stock

Two batches of *Vanaraja* and *Gramapriya* parents were reared at CPPM, Hosur during the reporting period, one in layer phase between 89 and 104 weeks of age (V) and one in grower and layer phase between 07 and 52 weeks of age(VI batch). A total of 464 (64 male and 400 female) parents of *Gramapriya* (VI batch) were in position, at the end of reporting period.

Egg production

The hen day egg production ranged from 32 to 42 % during 88-100 weeks of age with hen housed egg production of 264 at 100 weeks of age in V batch of *Vanaraja*. Similarly, the hen day egg production ranged from 41 to 47 per cent during 88 - 100 weeks of age in V batch of *Gramapriya*. The hen day and hen housed egg production of VI batch of *Vanaraja* and *Gramapriya* are presented in Table 10.

The fertility in V batch *Vanaraja* parent ranged from 88 to 91 % and hatchability (TES) ranged from 69 to 72 %. Similarly, the fertility 79 to 83 % and hatchability (TES) ranged from 61 to 65 % in V batch of *Gramapriya* (V batch) parents. The fertility and hatchability of VI batch of *Vanaraja* and *Gramapriya* are presented in Table 11.

Table 10. Egg production in *Vanaraja* and *Gramapriya* parents

Age in (wks)	*Vanaraja* (VI batch)		*Gramapriya* (VI batch)	
	HDEP (%)	HHEP (No.)	HDEP (%)	HHEP (No.)
20	0.0	0.0	0.0	0.0
24	8.5	0.3	1.1	0.3
28	39.1	11.2	11.8	3.6
32	64.3	28.9	45.3	16.2
36	57.6	44.8	66.3	34.8
40	43.8	60.6	76.9	55.8
44	52.6	75.0	68.3	74.2
48	39.9	86.4		
51	41.7	97.2		

Table 11. Fertility and hatchability in *Vanaraja* and *Gramapriya* parents (VI batch)

Age (wks)	*Vanaraja* (VI batch)			*Gramapriya* (VI batch)		
	Fertility	Hatchability (TES)	Hatchability (FES)	Fertility	Hatchability (TES)	Hatchability (FES)
30	89.3	73.5	82.2	89.7	57.6	64.3
34	90.8	71.7	79.0	89.9	75.0	83.4
38	90.7	70.8	78.0	89.9	75.2	83.7
42	90.8	69.8	76.8	89.8	65.4	72.8
46	90.1	70.4	78.1	-	-	-
50	89.6	75.8	84.6	-	-	-

Germplasm Supply and Revenue Generation

A total of 54,708 improved rural chicken germplasm of *Vanaraja* and *Gramapriya* were distributed to 1,056 beneficiaries including farmers and entrepreneurs throughout Tamil Nadu during 2022-23. The Centre has generated total revenue of Rs. 12.50 lakhs.

Constraints

No constraints were reported in the period.

ICAR-Central Coastal Agricultural Research Institute, Panaji (Goa)

Activity assigned

- Maintenance of parent stock for continuous supply of fertile eggs and chicks of improved chicken varieties for rural and tribal farmers
- Extending the germplasm supply to nearby coastal states
- Recording the performance of parents in the institute farm, analysis and documentation

Work done

Parent stock

During the period under report 82 male and 400 female chicks of *Srinidhi* and 276 female and 65 male parents of *Gramapriya* have been procured and reared at the centre. The average body weight of birds at different weeks of age is given in Table 12.

Table 12. Body weight (g) of parent lines at different weeks of age

Age (wks)	*Gramapriya*		*Srinidhi*	
	Male	Female	Male	Female
0 day	32.35±0.36		43.88±0.41	35.97 ± 0.32
4	494.47±10.61	213.35±4.27	389.78±1.78	229±0.71
7	1008.86±36.94	401.90±13.35	1324±24.75	430±10.48
14	2223±100.41	840.17±24.79	1622±13.57	1081±3.56
20	2317.80±81.71	1556.62±40.71	-	-
24	2319.43±83.44	1564.57±20.49	-	-
30	2919.71±100.80	1738.66±22.99	-	-
34	2984.74±130.01	1795.28±22.63	-	-
38	2852.11±95.43	1805.44±23.08	-	-
42	3023.85±88.39	1741.52±21.66	-	-
46	3024.87±92.54	1741.35±21.62	-	-
50	2997.74±88.10	1733.00±20.96	-	-
54	3091.64±125.38	1834.65±23.19	-	-
58	2984.86±119.87	1846.85±26.94	-	-
62	3153.56±111.11	1816.84±34.33	-	-

Egg Production

Hen Housed egg production up to 50 weeks of age for *Gramapriya* layers was 117.

Fertility and hatchability

The fertility varied from 75-80% and hatchability on total egg set was 72% for *Gramapriya*.

Germplasm supply

A total of 22,733 numbers of poultry germplasm including fertile eggs were distributed to 1002 farmers with a revenue generation of Rs 5,30,083/- during the period. Most of the farmers usually prefer to take 3-4 weeks after brooding and major vaccination. Backyard poultry chicks at the age of 4-6 weeks were distributed among the farmers through various agencies like ATMA and KVKs to promote backyard poultry farming in the state. Birds were also distributed among the farmers through tribal sub plan programme of institute along with feed, supplements, minor equipment and immunostimulant etc. Demonstration and training programmes were organized by our centre with the help of CPDO, Mumbai and under TSP programme for skill development and entrepreneurship.

Feedback from the farmers' field

More than 80% of people were rearing birds in deep litter system. Mostly farmers are depending on scavenging system of feeding and supplementing with wheat or broken rice and fresh bread crumbles for birds. Another unconventional feedstuff was Black-soldier fly larvae which is being reared on different kind of waste and then being utilized as an alternate source of protein in poultry. The housing was mostly semi-intensive type with provision of night shelter only. Adoption of backyard poultry feeding practices revealed that 84% of people were supplementing their feed in addition to scavenging, while 8% of people were solely given commercial feed. More than 65% of farmers were agreed to the point that poultry keeping was economical with respect to livelihood, nutrition and meeting emergency financial need. Employment generation through family poultry farming was minimum 182 to maximum 548-man day per year for male farmers, while minimum 91 to maximum 821-man day per year for female farmers. The farmers are selling eggs at Rs 10-15 and live birds at Rs 800-1000 at 2-2,5 kg for adults. Average egg production at farmers field was approximately 120-130 with supplementary feeding. On surveillance, the predominant diseases of poultry flock were Ranikhet disease, Coccidia, worm infestation, diarrhoea and Fowl pox. Mortality due to predator menace was a major concern in backyard birds. We conducted poultry farmer's field day in Divar and associated villages of Tiswadi taluka with interaction and awareness about vaccination, biosecurity, to reduce early chick mortality and proper management of poultry birds at different stages of growth. Dissemination of technologies and solving the queries of farmers are done through use of WhatsApp group named "Coastal poultry farming" by our center.

Constraints

- Less budgetary provision in recurring contingency was a constraint for purchasing feed and miscellaneous items during the reporting period.
- Problem in getting parts of incubator and hatcher in state and lack of cold storage facility for embryonated eggs contributed to lower hatchability.
- Budgetary provision for TA or procuring vehicles for field visit may kindly be included.

ICAR-Central Island Agricultural Research Institute, Port Blair (A & N Islands)

Activity assigned

- Construction of civil works
- Maintenance of parent stock for continuous supply of fertile eggs, day old and grown up chicks of rural chicken varieties.
- Analysis, documentation and reporting of the data.

Work done

Parent stock

The centre maintained 50 male and 150 female Nicobari birds. The body weight at different ages of Nicobari birds is presented in Table 13.

Table 13. Body weight of *Nicobari* birds

Age (wks)	Body weight (g)	FCR
2	120.24±4.12	4.65±0.22
4	368.9±3.21	4.45±0.22
8	786.13±2.63	3.73±0.44
12	1087.86±37.02	3.94±0.02
16	1218.2±23.16	4.67±0.16
Age at sexual maturity (156 days)	1507.24±11.69	-

Egg Production

The age at sexual maturity was 156 days. Hen day egg production was 56%

Fertility and hatchability

The hatchability (TES) was 75%.

Germplasm supply

The centre supplied 10,023 germplasm to farmers of Andaman and Nicobar Island with a revenue generation of Rs. 2,80,167.

ICAR Research Complex for NEH Region, Umiam (Meghalaya)

Activity assigned

- Maintenance of parent stock for continuous supply of fertile eggs, chicks of improved chicken varieties
- Recording the growth and reproductive performance in *Vanaraja* parent lines
- Collection of data on performance of *Vanaraja* birds from farmers' field and reporting their feedbacks.

Work done

Parent stock

Two batches of improved variety parent stock (one batch each for *Vanaraja*: 1473 and *Srinidhi*: 1070) were procured and reared under deep litter system in the institute farm for production and supply of improved varieties of chicks

The growth performance of *Vanaraja* parent lines upto 16 weeks and growth performance of *Srinidhi* parent lines recorded up to 40 weeks (Table 14) was recorded and found to be optimum under the current managemental conditions in the farm. Reproductive performance of *Srinidhi* parent lines has been presented in Table 15.

Feedback from the field

The performance of *Srinidhi* birds in the farmer's fields and the farmer's feedback were recorded and presented in Table 16. The performance of *Srinidhi* birds recorded up to 20 weeks was found to be optimum. The major diseases recorded in the farmers, field were Coccidiosis, Bacillary white diarrhoea, Infectious coryza etc. particularly during summer seasons, although overall survivability of *Srinidhi* birds at farmer's field upto 20 weeks was 87.62%.

Table 14. Body weights (g) in *Vanaraja* and *Srinidhi* parents

Age (wks)	*Vanaraja*		*Srinidhi*	
	Male	Female	Male	Female
0	41.26±1.24 12	39.10±0.89 4	36.17±0.45 12	30.2±0.62 4
4	404.11±13.89	301.39±8.92	300.34±8.69	169.58±5.51
8	1037.15±27.65	824.62±19.73	710±14.71	424.3±19.60
12	1479.07±29.61	1144.87±39.49	1245.08±29.86	859.86±21.08
16	1865.00±65.13	1586.29±53.26	1599.17±38.08	1141.96±35.59
20	-	-	1801±40.05	1459.57±27.98
40		--	2761.54±62.98	2281.43±57.22

Table 15. Reproductive performance of *Srinidhi* parent lines

Traits	Values
Average HDEP from 52-72 weeks (%)	37.21
Average egg weight (g) from 52-72 weeks	50.14±2.81
Fertility (%)	81.29
Hatchability on TES (%)	55.64
Hatchability on FES (%)	64.86

Table 16. Growth and mortality records of *Srinidhi* birds at farmers field (Mean±SE)

Traits		Male	Female
Body weights (g)	6 wks	378.94±9.87	312.45±6.75
	8 wks	548.04±29.06	435.70±18.20
	12wks	947.29±31.78	799.36±27.67
	16 wks	1376.48±53.79	1079.46±36.60
	20 wks	1641.11±49.80	1354.90±41.22
Mortality (%) from 6 to 20 weeks		12.38	
Age at First Egg (days)		178±2.01	
Hen Day Egg Production (%) up to 52 wks		32.13	
Egg weight (g) at 32 wks		41.31±1.22	
Egg weight (g) at 40 wks		45.22±2.41	
Egg weight (g) at 52 wks		49.04±2.17	

The majority of the farmers are rearing the birds under backyard system, although few farmers rear them under intensive system and are earning their livelihood through selling of birds and eggs. The selling price of live birds and eggs are reported to be ranged from Rs.250-350 per kg and Rs.12-15 per egg respectively. The overall acceptability and demand of *Srinidhi* birds is increasing among the rural farmers and consumers in the region.

Germplasm supply

A total of 17,744 chicks were supplied to 849 numbers of beneficiaries in the Meghalaya and revenue of Rs. 8,66,503 was generated during period.

Under the TSP component of the Poultry Seed Project, four numbers of farmer's training and field day cum demonstrations were organized. A total of 5300 numbers of chicks along with feeding and watering troughs, feed, medicines etc. were provided to 142 numbers of tribal farmers from different districts of Meghalaya during the period. Three exposure visits of local farmers/officers/ students of Meghalaya and other north-eastern states to the institute poultry farm were also arranged to impart them with basic poultry housing, feeding and health management systems.

Constraints

- Unavailability of feed ingredients to purchase in a timely manner resulting in higher feed cost.
- Irregular power connections and the high cost of diesel consumed by the generator for supplying uninterrupted power to the setting and hatchery units hampered the continuous chick production and supply

Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Srinagar (J & K)

Activity assigned

- Maintenance of parent stock for continuous supply of fertile eggs, day old and grown up chicks of rural chicken varieties.
- Analysis, documentation and reporting of the data.

Work done

Parent Stock

During the current year, this centre maintained two batches of *Vanaraja* parents. Stock I had 70 males 310 females of 16 weeks at 1.4.2022 and Stock II received on 10.10.2022 had 236 males and 1110 females. The body weights of male and female parents (Stock-I) at different ages are provided in Table 17. The body weights of male and female parents (Stock-II) at different ages are provided in Table 17.

Table 17. Body weight (g) of *Vanaraja* parent stock-I and II

Age (wks)	Stock I		Stock II	
	Male	Female	Male	Female
0 day			51.03	48.08
4			507.26	365.00
8			1265.2	1008.42
12			1876.91	1476.54
16	1776.32	1301.55	2205.66	1759.6
20	2265.23	1758.66	2622.44	2002.06
24	2553.32	1897.68		
28	2649.97	1989.10		
32	2801.22	2100.60		
36	3106.23	2289.09		
40	3275.91	2375.77		
44	3131.04	2301.83		

Egg Production

The egg production of the parent birds maintained at the center is provided in Table 18.

Table 18. Egg production of parent stock

Month	Age (wks)	HDEP (%)
April	23	17.5
May	27	28.2
Jun	31	39.00
Jul	35	51.71
Aug	39	77.17
Sep	43	78.53
Oct	47	67.10
Nov*	51	34.45

* Temperature dip due to approaching winter in Srinagar

Hatching Performance

The information on hatchability of eggs from *Vanaraja* parents are presented in Table 19. The highest hatchability (TES) was 86.00%.

Table 19. Hatching performance of *Vanaraja* parents

Month	Parent's age (wks)	HTES%	HFES%
April	23	28.09	34.02
May	27	40.3	52.34
June*	31	56.34	10.76
Jul	35	58.27	64.55
Aug	39	75.52	80.11
Sep	43	78.00	86.00
Oct	47	68.32	73.73
Nov	51	44.04	55.08

* Problen of male fertility

Germplasm supply

A total of 21,466 germplasm was distributed to farmers of Jammu and Kashmir during the year and generated Rs. 5,75,750 as revenue by sale of chicks and eggs during the period.

Tribal Sub-Plan Activities

Tribal Sub-plan activities took place from May, 2022. The trainings, exposure visits and input distribution were organized and a total of 2000 chicks and 2800kgs of feed distributed to 200 farmers in collaboration with Animal Science Scientists from KVKs of Kargil, Gurez, Budgam, Shopian, Pulwama, and Ganderbal.

Sri Venkateswara Veterinary University, Tirupati (A.P.)

Activity Assigned

- Rearing of parents and supply of fertile eggs and chicks
- Supply of chicks under SCSP programme
- Construction of vaccination room for chicks

Work done

Civil work

Construction of two poultry sheds were completed.

Parent stock

During the year 2022-23, existing batch parent birds (4th batch) are being maintained for germplasm supply and a total number of 500 day old parents *Vanaraja* chicks were received during August and December 2022 as replacement stock (5th and 6th batch). The average body weights of male and female parent birds of 4th batch at 64 weeks were 3391.57g and 2446.58g, 5th batch at 32 weeks were 2529.61 and 2408.95, 6thbatch at 16th week were 1792.29 and 1519.33 respectively (Table 20).

Table 20. Body weights (g) of *Vanaraja* parents

Age (wks)	Male	Female	Age (wks)	Male	Female	Age (wks)	Male	Female
	4th batch		5 th batch			6th batch		
12	1329.69 ± 98.43	1178.51 ± 101.6	4	339.92 ±24.73	259. 04 31.22	day old	38.69 ±43.62	37.16 ±51.22
16	1657.32 ±125.24	1323.66 ± 104.19	8	753.58 ±78,16	611.84 ± 66.15	4	370.68 ±56.43	298..71 ±92.62
20	2198.45 ± 115.35	1804.72 ±131.85	12	1427.66 ± 108.11	1228.51 ± 112.06	8	832.28 ±59.92	717.76 ± 106.03
24	2154.98 ± 132.19	1989.03 ±104.44	16	1698.36 ±121.81	1901.92 ± 138.66	12	1399.07 ± 77.27	1152.61 ± 79.19
28	2262.31 ±295.71	1971.63 ±94.61	20	2167.14 ± 112.17	1981.82 ±134.67	16	1792.29 ± 103.27	1519.33 ± 93.27
32	2394.54 ±114.65	2036.21 ± 158.60	24	2219.27 ± 122.94	2307.74 ±94.61			
36	2470.52 ±115.09	2085.53 ±104.09	28	2381..82 ±141.82	2317.16 ±104.44			
40	267.68 ±123.22	2146.68 ±129.13	32	2529.61 ±116.82	2408.95 ± 166.09			
44	2693.48 ±113.35	2241.47 ± 215.69						
48	3041.47 ± 215.69	2276.72 ± 110.17						
52	3198.11 ± 110.17	2321.27 ± 121.71						
56	3216.59 ± 145.22	2378..68 ±115.58						
60	3277.85 ± 176.72	2404.32 ± 105.51						
64	3391.57 ±171.15	2446.58 ± 116.33						

Egg Production

The hen day egg production of the fourth batch during 24 - 40 weeks period ranged from 12.38 % to 73.39% (Table 21) and later it is decreased and the hatchability was reached peek at 44 weeks (77%).

Germplasm supply

During the year 2022-23**,** a total number of 8,396 germplasm was supplied and an income of Rs 2,68,612/-was generated by sales of chicks, eggs and culled birds. The number of farmers benefitted are 175 apart from 80 farmers under SCSP programme. Further, total of 800 birds were distributed to the 80 farmers belonging to the villages of Mannasamudrum, Pudipatla and Srikalahasti mandals. Along with birds, feed, feeders, waterers, night shelters were also distributed on 30-5-22 and 4-1-23. Awareness given on rearing of improved backyard birds by distributing the leaflets and booklets to the farmers and also at training programmes conducted at various places during distribution of chicks under SCSP programmmes and training programmes organized by the other Departments under SVVU, Tirupati and also by the Dr. Y.S.R. Horticultural University, A.P.

Table 21. Production performance of 4th and 5th batch *Vanaraja* parent

	4th batch			5th batch			
Age (wks)	Egg wt (g)	HDEP (%)	Hatchability (%)	Age (wks)	Egg wt (g)	HDEP (%)	Hatchability (%)
24	46.03	12.38	41	20	46.44	15.34	-
28	47.39	20.34	63	24	47.92	21.38	34
32	48.84	55.86	75	28	49.31	35.64	41
36	51.62	61.45	79	32	50.57	45.86	45
40	51.95	73.39	81				
44	52.51	70.15	77				
48	53.29	67.19	74				
52	53.71	64.66	67				
56	53.92	55.82	61				
60	54.43	52.63	54				
64	55.09	49.27	47				

PVNR Telangana Veterinary University, Livestock Research Station, Mamnoor, Warangal (Telangana)

Activity assigned

- To take up the pending civil works on priority with regards to construction of hatchery.
- Maintenance of parent stock for continuous supply of fertile eggs, day old germplasm / growers *(Gramapriya variety* and improved native chicken – *Vanashree*).
- Recording the growth, production, fertility and hatchability in parents / commercials.
- Analysis, documentation & reporting of the data.

Work done

Parent Stock

The centre maintained parents of *Gramapriya*, Aseel cross bred, Kadaknath, Ghagus and *Vanashree* birds for the reporting period. The body weights of the above parents, commercial stock and improved native chicken are presented in Table 22 and 23.

Table 22. Body weight (g) of parents of *Gramapriya* and *Aseel* cross

Age (wks)	***Gramapriya*** 4th batch (parent stock)		***Gramapriya 5th batch*** (parent stock)		***Aseel*** cross	
	Male	Female	Male	Female	Male	Female
4	-	-	347 ± 1.47 (116)	158 ± 0.38 (699)	284±0.64 (208)	
8	-	-	911 ±2.43 (109)	558 ± 0.43 (645)	582±1.10 (174)	
12	-	-	1394±1.64 (106)	793 ± 0.71 (580)	828±0.73 (146)	
20	-	-	2082±2.17 (104)	1293 ± 0.58 (532)	1834±1.11 (53)	1580±1.85 (78)
40	2218±5.85 (153)	1737±2.20 (556)	-	-	-	-

Table 23. Body weight (g) of native chicken (*Kadaknath, Ghagus, Vanashree and Aseel*)

Age (wks)	*Kadaknath*		*Ghagus*		***Vanashree*** 2nd batch		***Aseel*** cross	
	Male	Female	Male	Female	Male	Female	Male	Female
40	1493± 16.94 (48)	1174± 7.83 (69)	2524± 2.24 (13)	1571± 2.83 (42)	2766± 2.59 (50)	1870± 2.24 (46)	2094± 11.35 (15)	1909± 24.25 (7)

Egg production

The egg production of different birds maintained at the centre is provided in Table 24. The hen housed and hen day egg production of Vanashree (2nd batch) was 49.1 and 51.2% respectively with egg weight of 53.0±4.12g at 40 weeks of age.

Table 24. Production performance in *Gramapriya* parents

Traits		*Gramapriya* 4th batch (parent stock)
EP (%) 32 wks	Hen Housed	42.1
	Hen Day	46.33
	Egg weight (g)	55 ± 1.22
EP (%) 40 wks	Hen Housed	36
	Hen Day	46.4
	Egg weight (g)	56 ± 1.32
EP (%) 52 wks	Hen Housed	45.9
	Hen Day	64.5
	Egg weight (g)	55 ± 1.15
EP (%) 64 wks	Hen Housed	42.2
	Hen Day	60.4
	Egg weight (g)	56 ± 1.22
EP (%) 72 wks	Hen Housed	38.5
	Hen Day	58.4
	Egg weight (g)	56 ± 1.22

Hatching performance

The hatching performance of *Gramapriya* parents in terms of fertility and hatchability is presented in Table 25.

Table 25. Hatching performance in *Gramapriya* parents, *Vanashree* and *Aseel*

Age (wks)	*Gramapriya* 4th batch (parent stock)		
	Fertility (%)	Hatchability (%)	
		TES	FES
28	69.31	52.49	75.74
36	84.81	58.03	68.43
40	89.69	65.26	72.75
52	94.97	80.54	84.80

Germplasm supply

A total of 50,709 germplasm supplied to 800 farmers and a revenue of Rs. 14,94,521 was generated.

Other Activity

Supplied about 100 nos. of *Gramapriya* chicks of 6 weeks age to 10 SC farmers under SCSP along with Grower feeder, drinker and one night coop. Also supplied 15 nos. each of chick drinker, feeder and electric hover to 15 beneficiaries under SCSP.

Constraints

Centre did not report any constraints

12 Critical Observations

BASU, Patna

Accomplishments and achievements

- Two batches of parents were reared
- Supplied 55367 germplasm to farmers
- Generated Rs. 18.81 lakhs of revenue

Short falls

- Nil

Suggestion for further improvement

- Data from field performance of birds should be recorded and reported

ICAR RC NEH, Jharnapani

Accomplishments and achievements

- One batch of parents each of *Vanaraja* and *Srinidhi* were reared
- A total of 61,368 improved chicken germplasm was distributed to the farmers
- An amount of Rs. 34.09 lakhs revenue was generated

Short falls

- Field data not provided
- Target of germplasm supply not achieved

Suggestion for further improvement

- Data from field performance of birds should be recorded and reported
- Efforts should be made to achieve the target supply
- ICAR RC NEH, Gangtok

Accomplishments and achievements

- Two batches of *Vanaraja* parents were in position
- Distributed 56,485 chicks to the farmers in the rural and tribal areas of Sikkim
- An amount of Rs. 14.02 lakhs of revenue was generated

Short falls

- Field data not provided
- Target of germplasm supply not achieved.

Suggestion for further improvement

- Data from field performance of birds should be recorded and reported

ICAR RC NEH, Imphal

Accomplishments and achievements

- One batch each of *Vanaraja*, and *Srinidhi* parents were reared
- The centre has supplied 12,420 chicks to farmers
- An amount of Rs. 14.61 lakhs of revenue was generated

Short falls

- Target of germplasm supply was not achieved

Suggestion for further improvement

- Efforts should be made to achieve the target supply

TANUVAS, Hosur

Accomplishments and achievements

- Two batches of parents were in position
- Distributed 54,708 chicks of *Vanaraja* and *Gramapriya* to the farmers in Tamil Nadu
- Generated an amount of Rs. 12.50 lakhs revenue

Short falls

- Target of germplasm not achieved

Suggestion for further improvement

- Data from field performance of birds should be recorded and reported
- Efforts should be made to achieve the target supply

ICAR-CCARI, Goa

Accomplishments and achievements

- One batch each of *Srinidhi* and *Gramapriya* parents were reared
- Distributed 22,733 chicks to the farmers and generated Rs. 5.30 lakhs revenue

Short falls

- Target supply not achieved

Suggestion for further improvement

- Efforts should be made to meet the target supply

ICAR-CIARI, Port Blair

Accomplishments and achievements

- The centre maintained one batch of Nicobari birds.
- Distributed 10,023 improved germplasm to the farmers
- An amount of Rs. 2.80 lakhs of revenue was generated

Short falls

- Target supply not achieved
- No detailed information on egg production and hatchability provided

Suggestion for further improvement

- Efforts should be made to achieve the target supply

SKUAST, Srinagar

- Accomplishments and achievements
- Two batches of *Vanaraja* parents were in position
- Distributed 21,466 chicks to the farmers.
- Generated Rs.5.76 lakhs revenue

Short falls

- Germplasm supply target not achieved

Suggestion for further improvement

- Efforts should be made to achieve target supply

ICAR-RC NEH, Umiam, Meghalaya

Accomplishments and achievements

- One batch each of *Vanaraja* and *Srinidhi* parents were reared
- Distributed 17,744 improved germplasm to the farmers
- Generated Rs. 8.67 lakhs revenue

Short falls

- Germplasm supply target not achieved

Suggestion for further improvement

- Efforts should be made to meet the target set for germplasm supply

PVNRTVU, Warangal

Accomplishments and achievements

- Two batches of *Gramapriya*, and Aseel and one batch each of Vanashree, *Kadaknath* and Ghagus were reared
- Distributed 50,709 chicks to farmers
- Revenue was Rs. 14.95 lakhs

Short falls

- Data of field performance not reported

Suggestion for further improvement

- Data from field performance of birds should be recorded and reported

SVVU, Tirupati

Accomplishments and achievements

- Three batches of *Vanaraja* were reared
- Distributed 8,396 chicks to farmers
- Revenue was Rs. 2.69 lakhs

Short falls

- Germplasm supply target not achieved

Suggestion for further improvement

- Data from field performance of birds should be recorded and reported

13 Success Stories

Success Stories of AICRP on Poultry Breeding and Poultry Seed Project

Success Stories of AICRP on Poultry Breeding

Success story from Himachal Pradesh

Title: Integration of backyard poultry farming in agriculture activities in mid-hill region by farmer adopted under livestock improvement initiatives

Challenge: Rural poultry farming is now showing potential in hill farming system when coupled with other farm activities by counteracting the constraints like disposal of product at premium price, optimum utilization of farm resources and sustainable agriculture. The strategy of promoting/incorporation of family poultry in farming portfolio of people already engaged in agricultural and related activities could serve as desirable approach to utilize maximum benefits from farm resources. Poor stockmanship and lack of suitable germplasm, marketing strategies, and decrease in availability of natural resources of feed and inadequate veterinary support are the main constraints identified for rural poultry farming system of Himachal Pradesh. Convergence with ongoing livestock improvement programme/initiatives for identification of motivated farmers who can intensify the scale of backyard poultry farming by optimum utilization of resources and linking the disposal and marketing strategies to fetch premium prices is one among desirable approaches. Sh. Sunil Kumar resident of village Kunsal and SHG member of ongoing project of Community fodder interventions initiative is involved in diverse agricultural activities including poultry farming as an integrated farm practice.

Initiative: During visit to farmers in another project on fodder intervention, the project team identified few beneficiaries who was willing to adopt backyard poultry farming. The young entrepreneur Sh. Sunil Kumar who is already practicing backyard poultry farming on small scale showed his willingness to increase the number and take backyard poultry on larger scale. During later exposure visit to university he was apprised of the location specific poultry variety "*Himsamridhi*" developed by AICRP on poultry breeding, (Rural unit) Palampur. Based on his resources, he was supplied 250 chicks in during April 2021 to start his backyard poultry rearing venture and extended technical advice from time to time including preventive measures against major diseases. The growths of the chicks supplied were periodically monitored by on farm visit. During on farm visit, his concerns were also addressed, and appropriate technical guidance/inputs were provided. The mortality in his flock was very less (less than 5%) during the chick and growing phases.

Key results/highlights/interesting facts: He was managing the backyard poultry with family labour and constructed three fabricated enclosures to house birds. He is also offering birds the fodder and unutilized household food waste. The compounded feed was also utilized during peak laying season as supplement to scavenging for ensuring optimum production. The laying started around October-November 2021 around 5-6 months of age. By the time he had sold surplus male stock and reared laying hen. The male birds/cockerels which attained body weight of 1.6-2.0 kg at about 5-months of age were sold as per need/demand @ Rs.600-700/per bird giving him income of Rs 20,000/- in six-month duration from sale of cockerels. According to Sh. Sushil Kumar during the winter season he earned handsome returns by selling of cockerels at premium price since country chicken is in great demand. The egg production of female birds was around 60-65 eggs per day from around 100 layers during the peak production in winter months. During this period, he was able to sell eggs @ Rs. 15 Rs per egg. At present, he is getting about 50 eggs daily giving him income of Rs. 500-600 per day.

His farming system for rural poultry was comprising of scavenging with incorporation of household grain and feed supplementation especially during peak laying. He also practices supplementation with vitamins, minerals, and calcium from time to time. A portion of eggs produced, and

cockerels were also consumed in the family to improve their nutritional quality. He owns small outlet for his other farm produce in the village market and the same was utilized by him for selling of desi chicken and egg for premium prices.

Impact: Sh. Sunil Kumar is realizing good return from poultry with incorporation of location specific poultry variety Himsamridhi. Coupled with his marketing skills along with the demand in the area he was able to dispose birds and eggs at premium prices. With his experience of marketing and farming he increase the stock to have around 200 layers at a time in batches so that continuity of supply could be ensured to his customer and to increase his profitability. He is continuing with backyard poultry by adding replacement batches of around 200 chicks periodically.

Additional information

The work was carried under All India Research Project on Poultry Breeding (Rural Poultry Center, Palampur) with financial support received from ICAR-Directorate of Poultry Research,

Contact Person(s): Dr Varun Sankhyan (PI), Dr Devesh Thakur and Dr K Dinesh
Email: sankhyan@gmail.com**,** drdth4@gmail.com, krishanender25@gmail.com
Phone: 9418534054, 9418495117, 8219106616

Fig 1: Himsamridhi birds under housing

Fig 2: Birds under open scavenging conditions

Success stories of Guwahati Centre

Success story 1

Title: "*Kamrupa*" a blessing for farmers in Assam and the North East.

Name of the farmer/entrepreneur: Mr. Shankar Rabha

Address with phone number: Village Salbari,Post office: Dhangar Gaon, Police Station Mirza, Dist. Kamrup (R), Assam, Telephone number: 6001281142

Background of the farmer: Mr. Shankar Rabha is a farmer. He wants to get himself engaged in poultry farming and also earned some money. He possessed a prime plot of land situated in close proximity to the market area, which facilitated the sale of his birds and eggs either in wholesale or retail quantities, all from the convenience of his doorstep.

Initiative taken by the farmer: Mr. Shankar Rabha was inclined towards poultry farming and visited the College of Veterinary Science at Assam Agricultural University in Khanapara to gain knowledge about the *Kamrupa* bird, after learning about it from friends and a TV program. Poultry farming is a popular practice in Assam, with over 90% of the population being non-vegetarian. Despite this, the slow growth rate of indigenous birds has resulted in a decline of interest in their rearing. As a solution, farmers prefer to rear the *Kamrupa* bird, which is a dual-purpose rural breed of chicken with a better body weight and egg production, making it ideal for both meat and egg production.

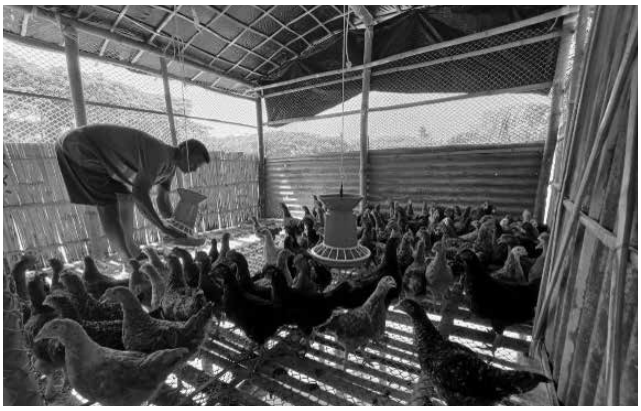
Details of breed /Variety reared: The breed of chicken being raised is called the "*Kamrupa*", which is a multicolored rural breed of chicken with a dual-purpose. The Kamrupa breed was developed under the All India Co-ordinated Research Project on Poultry Breeding, which falls under the Directorate of Research (veterinary) at Assam Agricultural University in Khanapara, Guwahati. Compared to the indigenous chickens of Assam, the *Kamrupa* breed

lays almost double the number of eggs and has nearly twice the body weight.

Scientific intervention provided by the Institute/Centrs/ KVK/AH Department (training, inputs etc:): The farmer was provided with comprehensive information on the rearing of *Kamrupa* chickens, which included detailed guidance on the management of *Kamrupa* chickens from the chick stage to the adult stage. The farmers were also educated on the nutritional and health management required for *Kamrupa* chickens. Additionally, a bilingual brochure with detailed information about *Kamrupa* was provided to the farmer. The farmer was also given free Lasota and R2B vaccines either on-demand or based on his requirement.

Achievements: Mr. Rabha, on average, received 100 *Kamrupa* DOC per batch. Out of these, approximately 89 birds survived until they were 5 months old. He sold these birds at the age of 5 months for Rs. 310 per kilogram, with an average weight of 1.6 kilograms. By selling the birds, he made an average profit of Rs. 5450 per month. According to Mr. Rabha, *Kamrupa* birds can be successfully raised and are a promising variety for meat production in rural areas. Over the course of a year, he had 7 batches, each consisting of 100 birds. The birds were fed 9.0 kilograms per bird until they reached 5 months of age, instead of the normal 10.5 kilograms, as the birds scavenge for food. The cost of feed per batch amounted to Rs. 3000 per quintal, which is a total of Rs. 27000. The cost of chicks was Rs. 2800 for 100 birds, and the expenses for medication, vaccines, and miscellaneous items amounted to Rs. 5000. The total cost was Rs. 34800. After deducting the expenses from the sales, which amounted to 89 birds multiplied by 1.6 kilograms per bird, multiplied by Rs. 310 per kilogram, the total sales amounted to Rs. 44144. Therefore, the income per batch was Rs. 9344, resulting in an average monthly income of Rs. 5450.

Socioeconomic impact: After obtaining necessary information from the AICRP on Poultry Breeding, Mr. Rabha procured an average of 100 birds per batch from them. By selling the birds at an average of Rs. 310/kg after 5 months, with an average weight of 1.6 Kg, he earned a profit of Rs. 5450.00 per month. This has inspired him to continue with poultry farming. Although he has encountered some disease outbreaks, he has managed to overcome them with strong biosecurity measures. The profit earned from rearing *Kamrupa* has not only helped him run his family comfortably but also had a positive effect on the socioeconomic aspects of his family. The key to success in any sector is knowledge, strong determination, and hard work, which Mr. Rabha exemplifies.



Source (Institute/AICRP Center/PSP Centre/KVK/ AHD) and contributors: All India Co-ordinated Research Project on Poultry Breeding, Directorate of Research (Vety.), Assam Agricultural University, Guwahati Centre and the contributor is Dr Niranjan Kalita, Principle Investigator of the project.

Success story 2

Title: Promotion of livelihood through "*Kamrupa*" rearing in rural areas of Assam

Name of the farmer/entrepreneur: Mr. Himanghu Deka

Address with phone number: Village: Nalisha, PO+PS: Belsor, Dist: Nalbari, Assam, Tel: +91 9706096034

Background of the farmer: Mr. Himanghu Deka, an unemployed youth from the village of Nalisha, PO+PS: Belsor in Nalbari district, rears some indigenous birds to earn money for his daily expenses. With a strong desire to engage in poultry farming and earn some money, with consultation with local veterinarian he recognized the potential of *Kamrupa* chickens as a profitable breed that could fulfil his aspirations. Equipped with the necessary knowledge and resources, he embarked on his *Kamrupa* chicken farming journey.

Initiative taken by the farmer: Nalbari district is an important district for poultry rearing in Assam, as there is a high demand for poultry meat in the area. While some individuals in the area follow scientific management practices, the majority rear indigenous birds using traditional methods. As a result, the production of poultry eggs and meat is quite low. To increase his profits and improve his livelihood, Mrs. Deka procured "*Kamrupa*" chicks and raised them under scavenging conditions. He found that he earned more profit compared to rearing indigenous flocks, and has therefore decided to focus on raising *Kamrupa* rather than indigenous chickens

Details of breed /Variety reared: The breed being raised by Mr. Deka is the "*Kamrupa*," which is a multi-coloured rural chicken breed with dual characteristics. It was developed under the All India Co-ordinated Research Project on Poultry Breeding, which falls under the Directorate of Research (Veterinary) at Assam Agricultural University in Khanapara, Guwahati. *Kamrupa* chickens are known for laying nearly twice as many eggs as indigenous chickens in Assam, while also having almost twice the body weight of their indigenous counterparts.

Scientific intervention provided by the Institute/Centrs/ KVK/AH Department (training, inputs etc:): Mr. Himanghu Deka is an unemployed youth from the village of Nalisha, in Nalbari district. He used to rear indigenous birds However, he soon realized that this endeavor was not financially viable due to the low productivity of indigenous bird breeds. Seeking a more profitable alternative, he sought advice from a local veterinarian who directed him to the College of Veterinary Science. It was there that he discovered the *Kamrupa* variety of chickens developed by the AICRP on Poultry Breeding in Guwahati. With preliminary training on rearing poultry in general and *Kamrupa* in particular, along with all the necessary details. He started a *Kamrupa* poultry farm, gradually improving his knowledge and skills in poultry rearing. He is now inclined to make poultry farming his livelihood security.

Achievements: Mr. Himanghu Deka received on an average 150 nos. Chicks in every batch from which average 135 nos. bird per batch survived till their market age. He maintained 6 batch per year. He sold the bird at the age of 4 months he sold @ Rs. 290/kg. The weight of the bird was on an average 1.3 kg. He got an average of profit Rs. 6222/ month and Rs.74670.00/year. (150x28=4200, feed 6.5 kg LS per bird @30/kg, 29250, Medicine and miscellaneous 5000, sale =175.5 kg @290=50895 so profit 50895-38450= 12445.00/batch as he reared 6 bath per year per month profit is Rs. 6222/month

It is learnt that with a good mindset, strong determination, aptitude for work and hardworking can very well help to progress in life.

Socioeconomic impact: After raising indigenous chickens and realizing their low productivity, Mr. Deka started a poultry farm with *Kamrupa* birds following our advice. With time, he gained expertise in poultry farming, especially with *Kamrupa* birds, and began to view it as a means of livelihood security. He not only earned a considerable profit, but also found stability and a reason to stay in the rural area rather than moving to urban society in search of a job.

Source (Institute/AICRP Center/PSP Centre/KVK/ AHD) and contributors: All India Co-ordinated Research Project on Poultry Breeding, Directorate of Research (Vety.), Assam Agricultural University, Guwahati Centre and the contributor is Dr Niranjan Kalita, Principle Investigator of the project.

Success Stories of PSP centres

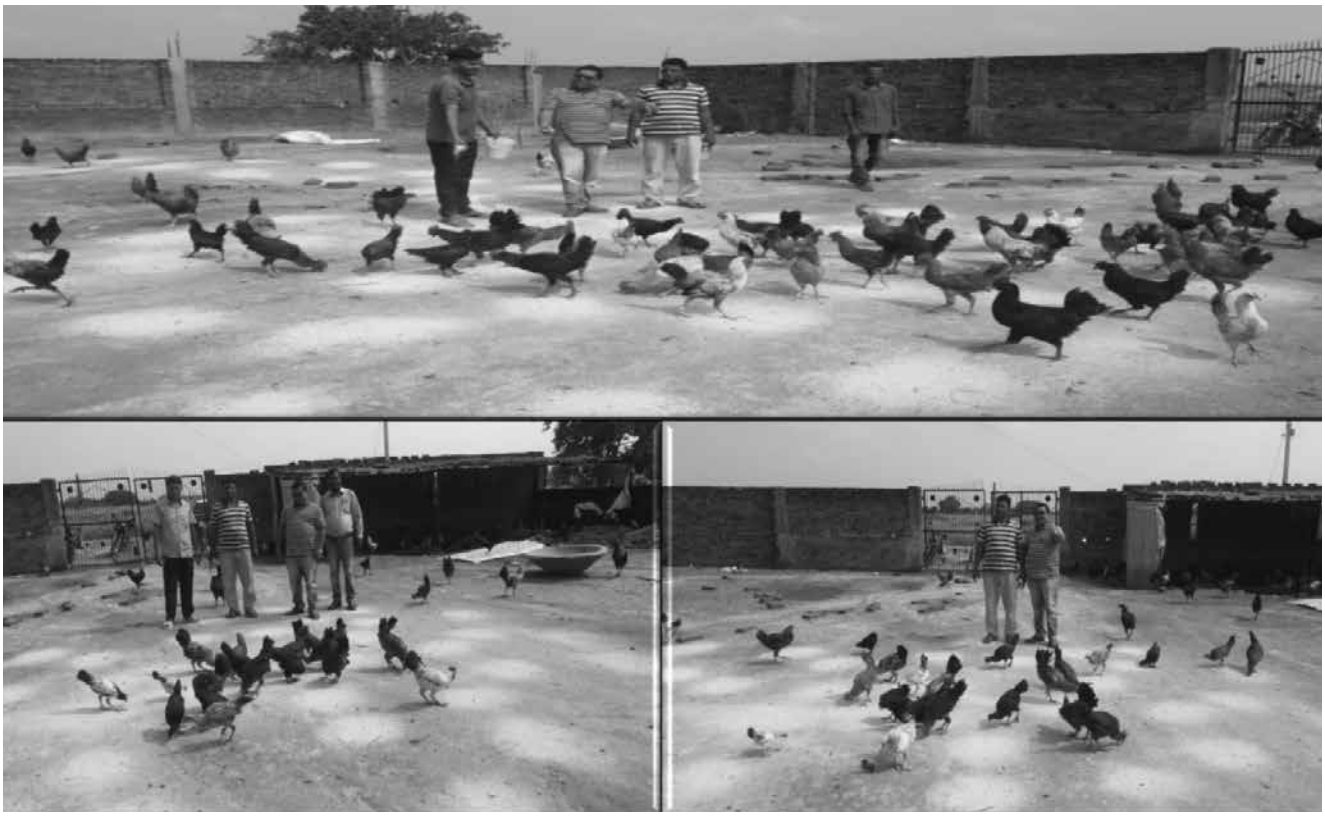
Success Story of Patna centre

Success story 1

Name of farmer: Motilal Yadav

Address: Village - Mangha, Siwan, Bihar

Getting training at BVC, Patna on poultry farming through ATMA, Siwan and started to rear 200 birds (*Vanaraja*) in June 2022. Mr. Yadav starts feeding them Moringa leaf, banana plant leaf, vegetable wastage of nearby local market and grains (waste) of FCI, godown etc. At present he has 800 *Vanaraja* birds in his form. He is selling male birds @350/- per kg in local market and eggs @ 20/- pc. He has trained 20 youth of his nearby area and most of them started rearing the birds at small scale. He also established a small hatchery unit of 200 eggs capacity and selling the DOC to local people.



Success story 2

Name of farmer: Begu Ram

Address: Village - Dhanauti, Daaronda, Siwan, Bihar

Sri Begu Ram started the Poultry Farming after getting 15 colored birds through PSP-SCSP project, BASU, Patna in the Month of July -2022. In the first lot only 10 birds were survived (8 males + 2 Females). He sold 5 males in Rs. 5800 in the month of Nov-Dec-2022. After getting the growth of birds and net profit he decided to rear *Vanaraja* birds at larger scale. He purchased 300 DOC of *Vanaraja* from PSP, Patna in the month of November 2022 for Rs. 6000=00. From the month of May 2023, he is selling eggs @20/- per egg. Now he constructed a Night shelter of 1000 capacity and rearing 500 *Vanaraja* birds in the semi-extensive system. He also visited PSP BASU farm and gets hands on training on poultry management. After seeing the success of Sri Begu Ram 6-7 other youth started rearing *Vanaraja* birds under backyard system after getting it from PSP Patna center.

Success Story from Manipur centre

Success story 1

Name of farmer: Kamei Lugkulung (39 years)

Address: Naorem Kabui Village, Bishnupur district.

He is a dedicated and sincere educated unemployed poultry farmer whose family depends on income generated from driving auto and poultry rearing. He reared some 100 numbers of *Vanaraja* birds supplied from ICAR Poultry Seed Project, Manipur Centre in the backyard as a source of income for household maintenance. Now he is happy with the income received from rearing poultry and he is ready to expand his poultry shed for rearing more number of birds.

Name	Kamei Lungkulung Kabui 
Address	Naorem Kabui Village, Bishnupur, Manipur
Input to the Farmers	100 numbers of *Vanaraja* chicks
Rearing system	Deep Litter System
Cost of commercial feed	30 bags x Rs 2400 = Rs 72,000
Cost of Rice polish for 100 birds till 72 weeks	1800kg X Rs 20/kg = Rs. 36,000.00
Cost Medicines and Vitamin	Rs 6,000
Expenditure from incubating eggs @ Rs. 4/ egg	480 eggs / month x Rs 2 = Rs. 960/ month (for 1 year, Rs. 960 x 12 months = Rs. 11,520)
Sale of chicks @ Rs 50/chicks	Rs. 15,000/month (for 1 year, Rs 15000 x 12 = Rs. 1,80,000)
Sale of excess male birds @ Rs.280/kg.	13 birds @ 3.8 kg = 54.6 Kg x Rs 280 = Rs. 13, 832/-
Monthly income from sale of eggs @ Rs. 12/egg	Rs. 600/ month x 12 months = Rs. 7200/year
Net Profit Annual	Rs. 75,512/-
Average monthly income	Rs 6,292/-

Success story 2

Name	Mr Jangkhosei Touthang (32 years)
Address	P.Phaimos village, Saikhul Subdivision, Kangpokpi district, Manipur
Input to the Farmers	100 numbers of *Srinidhi* chicks
Rearing system	Deep Litter System
Cost of Commercial feeds for 100 birds till 72 weeks	40 bags x Rs .2400=Rs. 96,000.00
Cost of Rice polish for 100 birds till 72 weeks	500kg X Rs 20/kg = Rs. 10,000.00
Medicines and Vitamin	Rs 5,000
Sale of excess male birds @280/kg	15 birds X 3.5kg , 52.5kg x Rs. 280 = Rs14,700.00
Sale of litter@Rs.5/kg	180kg x Rs.5 =Rs.900
Sale of Eggs@Rs.12/egg	Rs.12 X 40 eggs =Rs. 480
Daily income from sale of eggs	Rs. 480
Income from eggs for 50 weeks	350 days x Rs 480= Rs 1,68,000.00
Net Profit Annual	Rs. 1,01,600.00
Average monthly income	Rs 6,050/-

Success story from Hosur, Tamil Nadu

Name of farmer: Mrs. Parameshwari (Mobile: 09791316045),

Address: W/o, K. Ramesh kumar, aged about 40 residing at 199, Mela Street, Kalyanamahadevi (Po), Kottarakudi village in Tiruvarur (Pin Code: 613 704) District in Tamil Nadu

She is a housewife with basic knowledge about native fowl farming. She reared native fowl initially which was affected by Ranikhet Disease for the treatment of which she approached nearby Veterinary Hospital. She then came to know about the potential of *Gramapriya* chicken and then she underwent formal training on "*Desi* chicken rearing" in Farmer Training Centre of Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) located at Tiruvarur, in which she learned about scientific management of *desi* chicken. She initially received 30 no. of *Gramapriya* from College of Poultry Production and Management, Hosur under ICAR – Poultry Seed Project and reared them under scientific management. She got confidence and she followed rearing *Gramapriya* chicken with 50 no. in next batch and 100 in subsequent batches. She along with her children rear the birds.

The farmer rears the chicks under semi-intensive system of management. She sells the male birds for meat purpose and keeps the layer chicken for egg production. She sells about 30 to 40 eggs daily with monthly income of about Rs. 10,000 from egg sale. Further she started incubating the eggs and sells the day-old chicks through which she gets a profit of Rs. 25000-Rs.30000 per month. Her husband, who was a freelance electrician, quits his work and now joins in rearing the *Gramapriya* chicken along with her. The farmer thanked the CPPM, Hosur, Farmer Training Centre, Tiruvarur for supply of *Gramapriya* chicks and continuous knowledge support for scientific management of the chicken.

Success story from Goa

Title: JOAN'S FARM: Fresh and Hygienic

Name of the farmer/entrepreneur: Mrs. Eliza Dsouza

Address with phone number and Email: Thivim, Bardez, North Goa

Background of the farmer: She is new to backyard poultry farming. She did not have a backyard poultry unit previously. She was interested in starting a unit but was finding it hard to begin and needed help in understanding how to set up a backyard poultry farm. She has a land holding capacity of 1000 sq. m.

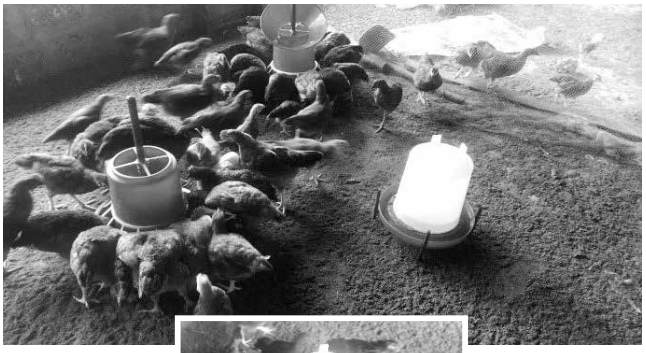
Initiative taken by the farmer*:* She constructed the poultry house as per the recommendations for hot and high rainfall areas. She procured chicks from our center. She practices incubation and hatching to propagate own flock.

Details of Breed/Variety reared: *Gramapriya*

Scientific Intervention provided by institute/centre/ KVK/AH Department (Training, inputs, etc): She attended a training in poultry organized by ICAR-CCAR, Old Goa. As she had no previous experience in the handling and management of poultry birds, she was trained in the same. She was also educated on the various feeding and housing practices of chicken. She was trained in the incubation, collection and proper handling of eggs. She was also provided with medicinal, feed and mineral supplements.

Achievements: She initiated her poultry farm with 20 *Gramapriya* chicks. She has now expanded her poultry farm to 250 birds.

Socioeconomic impact: Although a relatively new farmer, she follows scientific practices in the poultry unit which has helped to keep the birds at their best performance for maximum yield of eggs. In addition to personal consumption, she sells the produce at local markets. It has increased her income and she made a net profit of Rs. 70,000/- by selling the farm produce including poultry manure.



Success Story from Port Blair

Name of farmer: Smti. Rajeshwari, Mameyo

Successful graduated woman on advanced rural poultry farming with *Srinidhi* birds. After acquiring all the technical skills on scientific poultry farming, she was interested to establish rural poultry farming with *Srinidhi* birds for egg purpose. She availed loan from local cooperative bank. She started practicing all scientific methods of housing, feeding and health management for poultry. In a period of one year, she sold around 200 kgs of meat @ Rs.500 per kg for a sum of Rs. 1,00,000/- and sold eggs @ Rs.18 per egg for Rs. 44820/- and excluding expenditure on feeding for Rs. 48500/-, she could earn net income of Rs. 96320/-. This net income could contribute significantly to close her bank loan.

Success story from Srinagar

Providing Food Security in High Mountain Region and Earning High Return with *Vanaraja* Poultry Farming Entrepreneurship in Kargil, Ladakh- A success story

The issues of food security and its specifics in high mountain regions are often neglected and subsistence agriculture still forms the economic mainstay in these regions. Livestock production systems particularly poultry sectors can play an important role in uplifting the socio-economic system in this dry arid region in terms of nutrition and generating income. Ladakh is situated at 3000-3500 m above sea level, where harsh climatic environment is characterized by hypobaric-hypoxia, low humidity, high UV radiation, and extreme variation in ambient temperature (-20 to +30ºC), which causes high-altitude stress to poultry. Hence, not much progress has been made in poultry rearing in this region, as high altitude causes high mortality and poor growth resulting in heavy loss of farm economy. ICAR-Poultry Seed Project- Tribal Sub-Plan (PSP-TSP), SKUAST-Kashmir conducts programs around the year for the tribal farmers in terms of distributing free *Vanaraja* birds, poultry feed, and training programs on backyard poultry. A Tribal sub-plan was conducted in Kargil by PSP-SKUAST-Kashmir and *Vanaraja* chicks and poultry feed was disturbed among the farmer along with training on backyard poultry. One month after the program after seeing the performance of *Vanaraja* birds distributed in the TSP program, one of the farmers named Mr. Anwar Hussain got encouraged and approached Poultry Seed Project, SKUAST-Kashmir for purchase of *Vanaraja* birds and consultation to start an enterprise in Kargil, Ladakh.

Mr. Anwar Hussain, R/O Kanoor, Kargil, purchased 800 *Vanaraja* chicks at Rs. 85/- per chick from PSP-SKUAST-Kashmir, totalling Rs.68,000/- plus transportation charges of Rs.7800. Mr. Anwar left early in the morning on 22/10/2022 and arrived in Kanoor, Kargil that evening, but 31 chicks died due to long distance transportation stress and chilly winds enroute. At his farm, he reared chicks according to the scientific method imparted in training and was in constant contact with the PSP-SKUAST-Kashmir center for time-to-time directions. In the next 4 months, he suffered from 14 mortalities and average weight gain was 2 kg. Total expenses on feed and labour till then were about Rs.2.1 lakh approximately. In February, when the roads were closed and the market price was high, he decided to sell the birds. He fixed a price of Rs. 660 per bird, making Rs. 498300 in 22 days and clearing out the stock. Despite a high mortality rate at first, a net profit of Rs. 212500 was made. Additionally, he claimed that taking care of the birds was satisfactory, demonstrating the adaptability of *Vanaraja* birds to Ladakh. Additionally, the women in the household actively participated in bird rearing, turning their labor into meat and increasing profit. Encouraged by this, he has booked 1200 *Vanaraja* chicks for next year and has plans to start a small-scale commercial broiler farm besides backyard poultry.

Economics

Investment	Sale	Net profit
800 *Vanaraja* chicks @Rs.85/=Rs.68,000/- Transportation = Rs.7800. Expenses on feed and labour =Rs.2.1 lakh	Sale of 755 birds at a flat rate of Rs.660/ bird = Rs. 498300	Rs. 212500

***Vanaraja* birds in Kohnoor, Ladakh with GPS location.**

14 Proceedings of AICRP & PSP

Proceedings of the Annual Review Meeting of AICRP on Poultry Breeding and Poultry Seed Project held at College of Veterinary Sciences, SVVU, Tirupati on 8th and 9th September 2022

Inaugural session

Chief Guest: Dr. B.N. Tripathi, DDG (A.S.), ICAR

Guest of Honour: Dr. R.N. Chatterjee, Director, ICAR-DPR

Guest of Honour: Dr. V. K. Saxena, ADG (AP&B), ICAR

Other dignitaries

Dr. K. Sarjan Rao, Dean, C. V. Sc. Tirupati
Dr. Adilakshmamma, Associate Dean, C.V.Sc. Tirupati,
Dr. A. Ravi, Registrar, C. V. Sc., Tirupati,
Dr. K. Shakeela, P.I., P.S.P., C. V. Sc., Tirupati

The Annual Review Meeting of AICRP on Poultry Breeding and Poultry Seed Project for the years 2020- 21 and 2021-22 was organized at College of Veterinary Sciences, SVVU, Tirupati on 8th and 9th September 2022. Dr. B.N. Tripahi, DDG (AS) was the chairman, of the meeting. The inaugural session started with the invocation by Dr. Adilakshmamma, Associate Dean, C.V.Sc. Tirupati. Dr. K. Sarjan Rao, Dean, C. V. Sc. Tirupati, welcomed the chief guest, other dignitaries and participants. In his opening remarks Dr. R.N. Chatterjee, Director, ICAR-DPR highlighted the contribution of the poultry sector to the Indian economy and the role played by the AICRP and PSP centres in making available the improved germplasm of the poultry throughout the country.

Dr. V. K. Saxen ADG (AP&B), ICAR lauded the contribution of AICRP on Poultry breeding during the last 50 years of its existence in meeting the needs of animal protein. He commented on the need for using genomic tools for genomic selection to overcome the reduced genetic response in the elite pure lines. He also suggested to work on the mission of accomplishing zero non-descript poultry in the country. Dr. A. Ravi, the Registrar, expressed the gratitude to ICAR for establishing the PSP centre at C.V.Sc., Tirupati.

Honourable DDG (A.S.), ICAR, Dr. B. N. Tripathi appreciated for initiating the review meeting in offline mode after about two and half years. He congratulated the AICRP team for the successful completion of fifty years (golden jubilee) of its contribution. He suggested to bring out a document highlighting the achievements of AICRP during the last fifty years He stressed on the need for quantifying the contribution of the AICRP towards the economy of the country. He suggested to collaborate with agricultural economists to accomplish this task. He also suggested to improve the productivity of native or improved chickens in order to increase the availability of eggs from the present 90 eggs to the recommended level of 180 eggs per person per year. He emphasized on the need for the characterization of native chickens of the country to achieve the mission of zero non- descript birds. He emphasized to exploit the unique characteristics of native chickens to increase the income of farmers. Poultry welfare is an important area that needs to be given its due importance, he opined. He stressed that poultry health is an area that needs to be given more importance by educating the farmers about the necessity of adopting strict bio-security measures to prevent the outbreak of diseases such as VVND and LPAI or HPAI. Further, he mentioned that like in crop sciences/plant protection, the help of avian pathologists in the AICRP on poultry breeding needs to be taken to prevent the mortality and outbreak of diseases. He said these measures will help in achieving the objectives of the AICRP on poultry breeding. The inaugural session ended with a vote of thanks proposed by Dr. S. Shakila, P.I. PSP, Tirupati centre.

Dr. U. Rajkumar, In-charge, AICRP on Poultry Breeding and Dr. S.V.Rama Rao, In-charge, PSP presented the respective PC reports. Two technical sessions were conducted and the progress of the Centres was reviewed. Hon'ble DDG (AS) chaired all the sessions, while ADG (AP&B) and Director, ICAR-DPR, Hyderabad co-chaired. The officials from

the SVVU, Tirupati, team of scientists from ICAR-DPR, Hyderabad and Principal Investigators of all the Centres participated in the meeting.

Technical session -1

The technical session of ARM of AICRP centres was conducted on 8th September 2022 in which the The project coordinator's (PC) report of the AICRP on Poultry Breeding and Poultry Seed Project and progress reports of the AICRP centres were presented.

AICRP CENTRES

Presentation of the PC report of AICRP

Dr. U. Rajkumar, Pr. Scientist, ICAR-DPR presented the project coordinator's report of the AICRP on Poultry Breeding. He said that a new location-specific variety named 'Tokbari' a cross of *Dahlem Red* and Tripura local was developed and it is in pipeline for its release. The DDG emphasized increasing the number of success stories and publications from the centres and enquired about the low germplasm supply of Kerala and other centres. He also commented on the poor performance of the Bhubaneshwar centre. He recommended not to give satisfactory remarks for the centres which scored 'C' for their performance. Dr. V. K. Saxena, ADG enquired about not presenting the performance of native chickens by the CARI, Izatnagar centre. He also suggested to test the statistical significance level for genetic and phonotypic responses. He suggested to explore the possibility of including the new germplasm in layer lines to increase the variability and genetic response and exchange of CSFL and CSML of CARI with PB-1 and PB-2 of Ludhiana centres.

Presentation of PC Report of the PSP

Dr. S. V. Rama Rao, Pr. Scientist, ICAR-DPR, presented the progress report of the PSP centres. The DDG commented on calculating the total target achieved against the total target set as a percentage or proportion. There was a comment about the closure of the Kolkata centre. It was suggested to close the Port Blair centre. In-charges of the PSP centres were urged to prepare their own feed to reduce the feed cost and overcome the problem of poor-quality feed supplied by the firms.

The progress reports of respective centres of AICP on Poultry Breeding for the years 2020-21 and 2021-22 were made by the P.I.s of each centre.

Mannuthy Centre

The progress report of the Mannuthy centre was presented by Dr. S. Sankaralingam, Asst. Professor, KVASU, Mannuthy. The PI was suggested to take measures to improve the fertility and hatchability traits as they were low and also to increase the 16 weeks body weight as it was too less. The centre was urged to increase the germplasm supply since it has drastically reduced compared to earlier years. Despite the repeated suggestions, the centre did not study the egg quality traits in IWN and IWP layer lines therefore the PI was urged to take up this work without fail. The ADG suggested to test the statistical significance of the genetic and phenotypic responses of various traits including the age at sexual maturity.

Anand Centre

Dr. F. P. Savalia, Principal Scientist and Head, Poultry research station, AAU, Anand presented the progress report of the Anand centre during Technical Session 1. The centre was suggested to reduce the mortality of birds as it was high during 17-40 weeks of age in some lines. It was also suggested to calculate the feed intake of birds on per bird per day basis. The centre was asked to come up with a monograph on IWN and IWP lines in collaboration with the Mannuthy centre. The centre was asked to study the egg quality traits in IWN and IWP lines. The chair appreciated the progress made by the centre in germplasm supply and revenue generation.

Bengaluru Centre

Dr. Jaya Naik, Professor and Head, KVAFSU, Bengaluru presented the progress report of the Bengaluru centre. Following comments or suggestions were made to improve the performance of the centre. The homogeneity/uniformity in the morphological features of the native chicken population must be achieved. Feed restrictions in the PB-1 and PB-2 populations should be made. There was concern about the lower five weeks' body weight recorded in PB-1 and PB-2 populations. It was highlighted that the centre did not record the performance of the broiler control population in the last two years. Therefore, the P. I. was asked to take the broiler control population from ICAR-DPR to measure the genetic response of various traits in coloured broiler (PB-1 and PB-2) populations. It was also suggested to calculate all the production traits such as survivors', hen housed and hen day egg production.

Ludhiana Centre

The progress report of the Ludhiana centre was presented by Dr. Shaktikant Dash. Asst. Professor, GADVASU, Ludhiana. The ADG Dr. V. K. Saxena, asked the PI to calculate the heritability estimates with more number of observations with properly nested pedigree to reduce the errors of the estimates. He also suggested to accurately present the egg quality traits

or consult a poultry science expert to present the egg quality traits properly. The P.I was suggested to publish the research findings in reputed and high NAAS-rated journals.

Izatnagar Centre

Dr. Simmi Tomar, Principal Scientist, ICAR-CARI, Izatnagar presented the progress report of the CARI centre. ADG enquired about the poor fertility and hatchability recorded. He suggested to reduce the selection age from 16 weeks to 8 weeks in native chickens. Further, the suggestion was made to study the growth curve in the native chickens. The performance of the terminal cross must be evaluated as per the NBAGR guidelines.

Guwahati Centre

Dr. Niranjan Kalita, Professor and Head, C.V.Sc, Guwahati presented the progress report of the Guwahati centre. P.I. was suggested to improve the fertility and hatchability performance of germplasm maintained at the centre. He was further asked to take steps to register the variety developed at the centre. It was also suggested to find the specific and differentiating character in the native chickens of the centre from other chicken breeds. Dr. Kalita informed the house that *Daothigir* breed has barred plumage pattern.

Bhubaneswar Centre

Dr. S. K. Dash, Professor and Head, Odisha Veterinary college presented the progress report of the Bhubaneswar centre. He presented the performance of '*Hansli'* native chicken that was procured from the field. He also presented the automatic litter raking machinery that was developed under AICRP on UAE. The P.I. was suggested to adopt strict biosecurity measures to prevent the outbreak of disease as the centre has already witnessed outbreaks of HPAI twice in the centre.

Agartala Centre

Dr. Vinay Singh, Scientist, ICAR-RC NEH, Tripura centre presented the progress report of the Agartala centre. Dr. Singh was urged to improve the management or rearing conditions and adopt the feed restriction in grower birds of CSFL. He was asked to visit the farmers' fields frequently to understand the requirements of farmers. He was also suggested to increase the germplasm supply of the centre.

Jabalpur Centre

The progress report of the Jabalpur centre was presented by Dr. Giriraj Goyal, Assist. Professor. C.V.Sc. Jabalpur. Director appreciated the improvement of germplasm supply and revenue regeneration. However, the hatchability of all the germplasm of the centre was less. Therefore, the P.I. was urged to take up necessary measures to improve the hatchability. It was also suggested to supply the *Narmadanidhi* chicks to line departments to improve the germplasm supply.

Udaipur Centre

Dr. S. Mishra, Professor and Head, MPUAT, Udaipur presented the progress report of the Udaipur centre. It was noted that the germplasm supply and revenue generation of the centre was less. Therefore, the P.I. was suggested to explore the possibility of providing the parents of *Pratapdhan* to any government agencies to increase the germplasm supply. It was also noted that the mortality in some populations was high. Therefore, it was suggested to reduce the mortality of birds. He was suggested to come up with the future line of work for the centre by carrying out a survey of the farmers in the state/area.

Palampur Centre

Dr. Varun Sankyan, Asst. Professor, CSKHPKV, Palampur, presented the progress report of the Palampur centre. Germplasm supply of the centre was good. It was suggested to go for the memorandum of understanding with the state government department to supply the parents of *Himsamridhi* variety in order to make available its chicks and hatching eggs in large numbers to farmers. The P.I informed that the old generator needs to be replaced and he was told that if the generator is mentioned in the EFC the same may be procured. It was further suggested to improve the quality of the publication.

Ranchi Centre

The progress report of the Ranchi centre was presented by Dr. Sushil Prasad, Professor and Head, BAU, Ranchi. It was noted that both germplasm supply and revenue generation of the centre were less. Therefore, it was suggested go for the signing of the memorandum of understanding with the state government department for the supply of parents of *Jharsim* variety to increase the germplasm supply of the centre. He was further asked to come up with a new breeding program or work plan for the centre. Dr. Prasad informed the house that there is a change in the need of the farmers for egg type of birds. Therefore, the breeding program of the centre will be reoriented towards the development of the egg type of bird.

Technical Session 2

The technical session of ARM of PSP centres was conducted on 9th September 2022 in which the progress reports of the ten PSP centres were presented by respective P.Is.

POULTRY SEED PROJECT

Hosur Centre

Dr. S.T. Selvan, Dean, College of Poultry Production and Management presented the progress report of the Hosur centre. He requested to suggest what to do with the revenue generation amount lying with the centre. To this, honourable DDG suggested all the centres to send the revenue generated amount to ICAR-DPR, Hyderabad. The ICAR-DPR in turn will send this amount to the council. To this effect, a letter has to go to all the centres from ICAR-DPR, Hyderabad. Dr. Selvan informed the house that there was an outbreak of avian leucosis complex disease on the farm. However, health experts opined that there will not be any outbreak of ALV infection, it must be some other disease (Possibly Marek's disease). Therefore, the P.I. was suggested to initiate strict biosecurity measures to prevent the outbreak of the diseases.

Sikkim Centre

Dr. Mukesh Bhatt, Scientist, ICAR-RC NEH, Sikkim Centre presented the performance of the Sikkim centre. Dr. Singh informed the house regarding the requirement for an incinerator for the disposal of dead birds. However, it was suggested to go for the post-mortem pits as maintenance of incinerators is cumbersome and pollution issues are associated with it. The house revised the germplasm supply target of the centre from 50000 to 60000 for the present year.

Nagaland Centre

Dr. Mahak Singh, Scientist, ICAR-RC NEH, Nagaland centre of ICAR research complex presented the performance of the Nagaland centre. He informed the house that the setter and hatchers are needed to hatch chicks at the centre. Dr. Singh was asked to go for the procurement of the same if these equipments are reflected in the EFC and budgetary allocations were made in the EFC.

Mamnoor (Warangal) Centre

Dr. Hanumth Rao, Assst. Professor, SPVNRTSVU, livestock research station, Mamnoor presented the progress report of the Mamnoor (Warangal) centre. He informed the house that there is a high demand for native chickens like Aseel, Ghagus and Vanashree in the area. The native chickens are sold at the rate of Rs. 350 per kg live body weight. As the availability of Aseel chicks is less, it was suggested to go for the supply of chicks and hatching eggs of the Ghagus breed in the area. He informed the house that the cost of production of day-old chicks of improved variety such as *Gramapriya* was high at the centre. It was suggested to go for the reduction of feed cost by using some enzymes in consultation with the nutrition experts of ICAR-DPR. Honourable DDG suggested to input (budget allocated)-output (Revenue generated) analysis for all the centres including this centre.

Patna Centre

Dr. Pankaj Kumar, Professor, Bihar Veterinary College, BASU, Patna presented the progress report of the Patna centre. He presented the growth of *Vanaraja* and *Gramapriya* at weekly intervals. The Director suggested not to record the body weight at weekly intervals to avoid stress on the birds. Instead, it was suggested to go for the recording of body weight/ growth traits at 0 day, 4, 8, 16 and 40 weeks of age. It was suggested to go for collaboration with the K.V.K. Samastipur for exploring the supply of germplasm.

Manipur Centre

Dr. Chongthom Sonia, Scientist, ICAR-RC NEH, Imphal, presented the progress report of the Manipur centre. The germplasm supply of the centre was low and the mortality of birds was high. Therefore, it was suggested to go for strict biosecurity measures and to adopt appropriate management practices to reduce the mortality of the birds on the farm. Further, it was suggested to go for collaboration with the K.V.K. Imphal to increase the germplasm supply.

Umiam (Barapani) Centre

Dr. Sourabh Deori, Senior Scientist, ICAR-RC NEH, Umiam presented the progress of the Umiam (Barapani) centre. Dr. Deori informed the house that the new poultry shed is ready for utilization and in this shed around 3000 birds can be reared. Therefore, the house suggested to go for increasing the germplasm supply. The house also suggested to go for the feed restriction in grower birds to increase the production of hatching eggs.

Goa Centre

Dr. Nibedita Nayak, Scientist ICAR-CCARI, Panaji presented the progress report of the Goa centre. It was noted that the germplasm was low and egg production of the germplasm was less. The centre was urged to take steps to increase the germplasm supply and revenue generation. P.I. was also asked to provide all the relevant information well in time for the preparation of the report.

Srinagar Centre

Dr. A. A. Khan, Professor, SKUAST, Srinagar presented the progress report of the Srinagar centre. He requested to reduce the target of the germplasm supply in view of the prevailing weather conditions in the Jammu and Kashmir, and Ladakh areas. However, the house suggested to increase the germplasm supply as much as possible and to study the impact of the intervention made in terms of the supply of

germplasm and other inputs on the economic condition of the farmers/tribal people.

Tirupati Centre

Dr. S. Shakila, Professor and Head, C.V.Sc. (S.V.V.U), Tirupati presented the progress report of the Tirupati centre. House suggested to improve the germplasm supply, particularly those of native chickens as there is a huge demand for native chickens in the state.

Port Blair and Kolkata Centre PIs could not attend the meeting.

Plenary session

Dr. R N Chatterjee, Director ICAR-DPR chaired the session and Dr. V. K. Saxena, ADG (AP&B), ICAR graced the occasion.

Dr. Chatterjee told that the progress of AICRP & PSP centres was reviewed elaborately. He suggested that all the centres should meet their respective targets. He told that the Agartala centre should expedite the development of location-specific variety. He also suggested that PSP centres should give emphasis to farmers' feedback. He told the elite population must be maintained as per the technical program. He wished the P.I. of all the centres the best for their future endeavour.

Dr. V. K. Saxena, ADG (AP & B) ICAR, reiterated that the research outputs of the centres must be enhanced, the presentations must be properly done by checking for discrepancies or errors in the data. He further said that proper statistical tools must be employed for the data analysis. He advised all the centres to achieve the given targets.

P. Is of the various centres requested for enhancing the grant under recurring contingency head so that the genetic progress and germplasm supply target can be achieved. Some centres even requested to enhance the recurring continency for diverting the fund from the salary component in view of the prevailing financial situation.

Dr. Niranjan Kalita, Professor and Head, C.V.Sc, Kanapara, Guwahati was felicitated as he is nearing to his superannuation and house acknowledged his contribution to the AICRP on Poultry Breeding during his tenure as P.I. of the Guwahati centre.

Dr. U. Rajkumar, Pr. Scientist, ICAR-DPR and in-charge, AICRP cell proposed a vote of thanks.

Recommendations

1. The pedigreed population of native chicken need to be maintained with the proper pedigreed record.
2. All the centres should bring out quality publications from the results arising out of the research work done under AICRP on Poultry breeding. It is mandatory to acknowledge the funding from ICAR through AICRP on Poultry Breeding in whatever publications are going to be made under AICRP and PSP
3. Tripura centre must act proactively and take all the steps to release the new variety before the end of the current year
4. It is mandatory to preserve the raw data of the research work under AICRP on Poultry Breeding and P.I. is responsible to maintain the data and make available to the ICAR whenever needed.
5. All the centres should take strict biosecurity measures and adopt necessary management practices to reduce the mortality of birds.
6. The input (budget allocated)-output (Revenue generated) analysis must be carried out by all the centres.
7. Native chicken breeds such as *Aseel, Ghagus, Kadaknath and Nicobari (*ICAR-DPR) and other native breeds avialble from different AICRP centres may be included in the propagation of PSP centres.
8. The target for the supply of germplasm for the Sikkim centre is increased 50000 to 60000 per year.
9. All the centres need to carry out impact analysis and need to collect feedback from the farmers.

Action Taken Report on the recommendations of AICRP and PSP annual review meeting held at College of Veterinary Sciences, SVVU, Tirupati, 8th and 9th September 2022

Sl. No.	Recommendations	
	General	Action taken
1	The pedigreed population of native chickens need to be maintained with the proper pedigreed record.	Some centres started maintaining the pedigreed populations and records of native chickens wherever facilities are available.
2	All the centres should bring out quality publications from the results arising out of the research work done under AICRP on Poultry breeding. It is mandatory to acknowledge the funding from ICAR through AICRP on Poultry Breeding in whatever publications are going to be made under AICRP and PSP.	Some centres have published research articles in quality journals.
3	Tripura Centre must act proactively and take all the steps to release the new variety before the end of the current year.	Tripura Centre has complied with the recommendation, accordingly, it applied for the release of *'Toqbari'* variety to the ICAR-NBAGR, Karnal
4	It is mandatory to preserve the raw data of the research work under AICRP on Poultry Breeding and P.I. is responsible to maintain the data and make available to the ICAR whenever needed.	Informed the centers.
5	All the centres should take strict biosecurity measures and adopt necessary management practices to reduce the mortality of birds.	Centers assured that they are taking adequate biosecurity measures to prevent disease outbreaks.
6	The input (budget allocated)-output (Revenue generated) analysis must be carried out by all the centres.	Informed the centres.

15 Publications

Research papers

Dahariya, N., Sathapathy, S., Mishra, U.K., Patra, R., Dehury, S., Joshi, S.K., Sahu, S.K., Samal, L. and Jena, B. 2023. Age related histomorphometrical studies on the major lymphoid organs of chicken. Indian Journal of Animal Research, 57 (3): 322-327. 10.18805/IJAR.B-4318

Dinesh K, Sankhyan V, Thakur D, Kumar R and Thakur YP. 2023. Performance evaluation of Dahlem Red, Rhode Island Red and Native Chicken under intensive management in Himachal Pradesh. The Haryana Veterinarian (Accepted)

Dinesh K, Sankhyan V, Thakur D, Kumar R, Bhardwaj N and Katoch S. 2023. Effect of genotype and season on fertility and hatchability of eggs in Dahlem Red, Native and DND chicken under intensive system in Himachal Pradesh. Indian Journal of Animal Sciences (Accepted for publication).

Meena, J.P. Gupta, L., Sharma, S.K., Mishra, S. and Goswami, D.S. 2022. Effect of supplementation of moringa leaf powder (Moringa oleifera) on growth and production performance of Pratapdhan chicken under organic management system. Indian Journal of Animal Sciences, 92 (7): 892-895.

Mishra, S., Chatterjee, R.N., Haunshi, S. and Rajkumar, U. 2022. Characterization of Mewari, an indigenous chicken breed from hot tropical climate of India. Indian Journal of Animal Sciences, 92(12): 1408-1414.

Mishra, S., Dash S.K., Samal, L., Mallick, B.K., Karna, D.K., Mishra, P.C., Mishra, C. and Kundu, A.K. 2023. Phenotypic characterization and body conformation traits of native Vezaguda, Phulbani and Hansli chickens of Odisha. The Pharma Innovation, 12 (1): 1001-1004.

Mohanta, N.B., Samal, L., Behura, N.C., Pati, P.K., Maity, A. and Bagh, J. 2022. Growth performance, feed utilization efficiency and blood biochemical parameters of Nusuri chicken population of Odisha in floor rearing system. The Indian Journal of Animal Sciences, 92(8), 1006–1012. https://doi.org/10.56093/ijans.v92i8.102495

Muwal, H., Gupta, L., Mathur, M.C., Mishra, S., and Bhateshwar, V. 2023. Constraints analysis of organic poultry farming in southern Rajasthan. The Pharma Innovation, 12(3):3293-3296.

Patra, A.L., Samal, L., Behura, Sahoo, N., Das, D.P., Champati, A., Muduli, S. and Popalghat, H.K. 2022. Feed and nutrient utilization efficiency and juvenile traits of Vezaguda chicken of Odisha in floor rearing system. The Indian Journal of Animal Sciences, 92(12):1445-1450. https://doi.org/10.56093/ijans.v92i12.102484

Singh, S., Mishra, S., Gupta, L., Jat, G., and Acharya, P. 2022. Comparative study on external egg quality traits in indigenous and improved chicken. Frontiers in Crop Improvement. 10: 3014-3016.

Singh, V., Deo, C., Doley, S., Bhanja, S.K., Chakraborty, A. and Godara, R.S. 2022. Effect of Feeding Rice Based Brewers Dried Grain on Nutrients Utilization and Skeletal growth in Broiler Chicken. Indian Journal of Poultry Science, 57(3): 225-232. DOI: 10.5958/0974-8180.2022.00039.3

Review Papers

Singh, M., Mollier, R. T., Paton, R. N., Pongener, N., Yadav, R., Singh, V., Katiyar, R., Kumar, R., Sonia, C., Bhatt, M., Babu, S., Rajkhowa, D. J. and Mishra, V.K. 2022. Backyard poultry farming with improved germplasm: Sustainable food production and nutritional security in fragile ecosystem. Frontiers in Sustainable Food Systems. Published 18 October 2022. DOI 10.3389/fsufs.2022.962268.

Book Chapter

Singh, V., Chakraborty, A., Kolluri, G., Sahoo, L., Singh, M., Shinde, A., Chouhan, L., Rokade, J., Kumar, A., Kumar, R. and Das, B. 2023. Poultry Hatchery: A Profitable Venture in North East India. In: "Recent Advances in Avian health and Management". (Eds.) Tiwari, S.P., Sharma, R.K., Verma, J., Goel, G., Chouhan, L. and Shinde, A. Sandarbh Prakshan, Bhopal. Chapter 21. pp: 160-169.

Abstracts presented in conferences

Singh, V., Deo, C., Chakrabarti, A., Godara, R.S., Doley, S., Singh, M., Das, A., Sahoo, L., Devi, L. and Das, B. 2022. Effect of Feeding Rice based Brewers Dried Grain on Production Performance and Cost Economics of Laying Hens. IN "XXXVII Indian Poultry Science Association Conference (IPSACON 2022) and National Symposium on Recent Advances in Sustainable Poultry Production for Livelihood and National Security" held on November 4-6, 2022 organized by Department of Poultry Science, DUVASU, Mathura, Uttar Pradesh, India. In souvenir and Compendium, pp: 45.

Singh, V., Deo, C., Chakrabarti, A., Godara, R.S., Doley, S., Singh, M., Kumar, R., Das, A., Sahoo, L., and Das, B. 2022. Effect of Feeding Rice based Brewers Dried Grain on Immune Response and Blood-Biochemical Parameters in Laying hens. IN "XXXVII Indian Poultry Science Association Conference (IPSACON 2022) and National Symposium on Recent Advances in Sustainable Poultry Production for Livelihood and National Security" held on November 4-6, 2022 organized by Department of Poultry Science, DUVASU, Mathura, Uttar Pradesh, India. In souvenir and Compendium, pp: 193.

Singh, V., Deo, C., Chakrabarti, A., Godara, R.S., Singh, M., Das, A., Sahoo, L., Das, B., Rajkumar,U. and Niranjan, M. 2022. Comparative evaluation of fertility and hatchability of different chicken breeds/varieties/ crosses in hot humid climatic condition of Tripura. IN "XVI Annual Convention of Indian Society of Animal Genetics and Breeding (ISAGBCON 2022) and National Conference on "Innovations in Animal Genetics & Breeding for sustainable productivity of Livestock and Poultry" held on 2nd & 3rd December, 2022 at ICAR- Directorate of Poultry Research, Hyderabad, Telangana. In Compendium, ABST-1-063, pp: 136.

Suja, C.S., Sankaralingam, S., Beena C. Joseph, Binoj Chacko, P. Anitha, S. Harikrishnan and S. Devavratha. 2022. Comparative evaluation of production performance of six generations of Tellichery chicken breed of Kerala. In: National Conference on Native Chicken held at Madras Veterinary College, Vepery, Chennai from 22nd to 23rd, September, 2022. pp. 70.

Awards/Honors

Dr. Vinay Singh, Tripura Centre was awarded, for development of BND poultry variety and outstanding contribution in the area of Poultry Research and Development in Tripura by Income Tax Department, North Eastern Region, Agartala, Govt. of India.

Thesis submitted (MVSc)

Archana S. 2023 Enrichment of chicken egg by dietary inclusion of flaxseed oil, fish oil and their combination (Dr. S. Sankaralingam). M.V.Sc., Thesis submitted to the University.

16 Addresses

AICRP-PB Centres

Dr. S. Sankaralingam
Senior Scientist,
I/C. AICRP on Poultry Breeding,
Kerala Veterinary and Animal Sciences University,
Mannuthy - 680 651, Thrissur, Kerala
Email: poultryaicrp@kvasu.ac.in;
sankaralingam@kvasu.ac.in
Mob: 9495535500; 9447688783

Dr. F. P. Savaliya
I/C. AICRP on Poultry Breeding,
Principal Scientist & Head
Poultry Research Station
Veterinary and Animal Science Research and Extension Unit (VASREU)
Kamdhenu University, Anand-388110 (Gujarat)
Mobile No. : 9537913412
E-mail: fpsavaliya@kamdhenuuni.edu.in, prsand@kamdhenuuni.edu.in (Office)

Dr. Jayanaik
I/C. Professor & Head
Department of Poultry Science.
Veterinary College,
Karnataka Veterinary, Animal and Fisheries Sciences University (KVAFSU)., Hebbal, Bengaluru - 560024.
Email: dr.jnaik2007@rediffmail.com
Mob: 9620539740

Dr. Saroj Kumar Sahoo
I/C. AICRP on Poultry Breeding, Assistant Professor (AG&B), Department of Animal Genetics and Breeding College of Veterinary Sciences (COVS),
Guru Anand Dev Veterinary and Animal Sciences University, Ludhiana - 141004, Punjab.
email: saroj6804@gmail.com
Phone: 8930938355

Dr. Simmi Tomar
Principal Scientist, AG&B Division, ICAR-Central Avian Research Institute, Izatnagar - 243122, Bareilly, U.P
email: simmi1968@gmail.com, simmitomar@rediffmail.com
Phone : 7906361577

Dr. Lipismita Samal
I/C. AICRP on Poultry Breeding,
College of Veterinary Sciences and Animal Husbandry,
Odisha University of Agriculture & Technology (OUAT),
Bhubaneshwar – 751003, Odisha
email: oicaicrppoultry.ouat@gmail.com
Phone: 8847860677

Dr. Vinay Singh
I/C. AICRP on Poultry Breeding, Scientist, ICAR Research complex for N.E.H. Region,
Tripura Centre, Lembucherra - 799210, Tripura (West).
email: vinvet1@gmail.com
Phone: 8974609227

Dr. Vaishali Khare
I/C. AICRP on Poultry Breeding, Department of Animals Generals & Breeding,
College of Veterinary Sc. & Animal Husbandry, Nanaji Deshmukh Veterinary Science University, Adhartal,
Jabalpur-482004 (MP).
email: vaishalikhare0429@gmail.com
Phone:7999523643

Dr. Mihir Sarma
I/C. AICRP On Poultry Breeding &
Junior Scientist (Science), Directorate of Research (Vety), Assam Agricultural University ,Khanapara,
Guwahati-781022
email: mihirsarma21@gmail.com
Phone: 9435087901

Dr. Sushil Prasad
I/C. AICRP on Poultry Breeding, University Professor and Head,
Department of Livestock production and Management,
Faculty of Veterinary Science & Animal Husbandry,
Birsa Agricultural University, Kanke, Ranchi - 834006.
Jharkand.
email: sushil.poullpm@yahoo.co.in.
Phone: 9431594244

Dr. Varun Sankhyan
I/C. AICRP on Poultry Breeding, Assistant Professor,
Department of Animal Genetics and Breeding,
College of Veterinary & Animal Sciences, CSKHPKV,
Kangra, Palampur -176062, HP.
email: sankhyan@gmail.com
Phone: 9418534054

Dr. Siddhartha Mishra
I/C. AICRP on Poultry Breeding Assoc. Prof. & Head
Department of Animal Production, Rajasthan College of Agriculture, MPUAT, Udaipur - 313 001, Rajasthan
email: drsiddharthamishra@gmail.com
Phone: 9414978472

PSP Centres

Prof. Azmat Alam Khan
Associate Director Research & OSD to Vice Chancellor
PI, ICAR- Poultry Seed Project, Division of LPM, FVSc & AH, SKUAST-K, Srinagar J&K 190006
email: azmatalamkhan@gmail.com.
Phone: 9796936363

Dr. Pankaj Kumar
PI, ICAR-Poultry Seed Project, Associate professor
and Head, Vety. & AH Extension Education.
Bihar Veterinary College,
Bihar Animal Sciences University Patna. Bihar 800014.
email: drpankajvet69@gmail.com.
Phone: 9835676663

Dr. S.T. Selvan
Dean and PI, ICAR-Poultry Seed Project,
College of Poultry Production and Management
Mathigiri, Hosur- 635 110
email: deancppm@tanuvas.org.in
Phone: 9444227466

Dr. Mahak Singh
Scientist & PI, ICAR-Poultry Seed Project, ICAR RC for NEH Region Nagaland Centre, Medziphema - 797 106, Nagaland.
email: mahaksinghivri@gmail.com
Phone: 9474939889

Dr. Changtham Sonia
Scientist and PI, ICAR-Poultry Seed Project,
ICAR RC for NEH Region Manipur Centre, Lamphelpat,
Imphal, Manipur - 795 004
email: drsonia.vet@gmail.com
Phone : 8954011374

Dr. Ramgopal Devadas
HORC & PI, ICAR-Poultry Seed Project,
ICAR Research Complex for NEH Region, Sikkim Centre
Tadong, Gangtok,
Sikkim-737 102
email: jdsikkim.icar@gmail.com

Dr. T. Sujatha
Senior Scientist & PI, ICAR-Poultry Seed Project, Central Island Agricultural Research Institute (CIARI), Portblair, A&N Islands 744101.
email: drsujathaars@rediffmail.com.
Phone: 9531818976

Dr. Nibedita Nayak
Scientist & PI, ICAR-Poultry Seed Project,
ICAR - Central Coastal Agricultural Research Institute
Old Goa, Panaji, Goa 403 402.
email: drnibeditavet@gmail.com.
Phone: 7252925732

Dr. Sourabh Deori
Senior Scientist & PI, ICAR-Poultry Seed Project,
ICAR Research Complex for NEH Region, Umroi Road,
Umiam-793103, Meghalaya.
email: sourabhd1@rediffmail.com.
Phone: 9401274039

Dr. P. Amareswari
PI, ICAR - Poultry Seed Project
Livestock Research Station
P V Narsimha Rao Telangana Veterinary University
Mamnoor, Warangal, Telangana - 506166
email: amarvety@yahoo.com
Phone: 9440566429

Dr. S. Shakila
Professor and Head, PI, ICAR-Poultry Seed Project,
Department of Poultry Science,
College of Vety. Sciences, Sri Venkateswara Veterinary University, Tirupati, A.P.
email: drshakilas@yahoo.co.in.
Phone: 9440167225

Distribution of inputs at Agartala (Tripura) centre of AICRP on PB

A woman farmer with *Toqbari* birds at Tripura

Participants of Annual Review Meeting 2022 at SVVU, Tirupati

Inauguration of Feed Plant at PSP Centre, PVNRTVU, Warangal

Dr.R.N.Chatterjee, Director & Dr. V. Padmanabha Reddy, VC inaugurating the poultry House at SVVU, Tirupati

Input distribution under TSP at PSP centre, Manipur

Inauguration of Hatchery at PSP Centre, PVNRTVU, Warangal

Punjab Brown birds at Ludhiana centre of AICRP on PB

Kamrupa birds at Guwahati centre of AICRP on PB

Native birds under free range system at Himachal Pradesh

Native chickens at Ranchi centre of AICRP on PB

Gramapriya birds under scavenge at farmer's field in Goa

Gramapriya Parent stock at PVNRTVU, Mamnoor

Narmadanidhi

Jabalpur Colour Male

Jabalpur Colour Female

Brochures

ICAR-DPR You Tube Channel

Contact us

भाकृअनुप - कुक्कुट अनुसंधान निदेशालय

ICAR-DIRECTORATE OF POULTRY RESEARCH

ISO 9001-2015

Rajendranagar, Hyderabad-500 030, Telangana, India

Ph: +91 (40) 24015651/7000/8687 Fax: +91 (40) 24017002

Email: pdpoult@nic.in Website: www.pdonpoultry.org