

State-wise comparison of AI Delivery activities.

Surabhi Gupta

Animal Breeding Group

National Dairy Development Board, Anand – 388 001

Presentation Outline

- Introduction
- Main Components of Animal Breeding
- Semen Production Scenario in the Country
- Artificial Insemination (AI) Activities in the Country
- Key Policy Interventions
- Conclusion

Introduction

India: Largest producer of milk since 1997

During 2014-15

- Total Production - 146.3 million tonnes (18.5% of world production)
- Growth Rate - 6.26% (World's growth Rate - 3.1%)
- Per capita availability - 332 grams per day (World's average – 294 grams per day)
- Highest state producing milk – Uttar Pradesh (23.33 million tonnes) with 17% of total milk production in the country (*Source*)
- Cattle Population – 190.9 million; Buffalo Population – 108.7 million (*19th Livestock Census- 2012*)

(Source: Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, GoI)

Main components of breeding

Breeding policy

```
graph TD; BP(Breeding policy) --> HGM(Produce High Genetic Merit (HGM) bulls); BP --> QS(Produce quality semen); BP --> AIS(Provide quality AI service); HGM --> HGM_P["SET STANDARDS<br/>EVALUATE<br/>PERIODICALLY CERTIFY<br/>PROGRAMME"]; QS --> QS_P["SET STANDARDS<br/>EVALUATE PERIODICALLY<br/>CERTIFY STATION"]; AIS --> AIS_P["SET STANDARDS<br/>REGISTER PROVIDER<br/>EVALUATE PERIODICALLY"]; HGM_P --> DB["Maintain a live computerised database<br/>_use information<br/>_improve productivity"]; QS_P --> DB; AIS_P --> DB;
```

- **Produce High Genetic Merit (HGM) bulls**

- **Produce quality semen**

- **Provide quality AI service**

**SET STANDARDS
EVALUATE
PERIODICALLY CERTIFY
PROGRAMME**

**SET STANDARDS
EVALUATE PERIODICALLY
CERTIFY STATION**

**SET STANDARDS
REGISTER PROVIDER
EVALUATE PERIODICALLY**

Maintain a live computerised database _use information _improve productivity

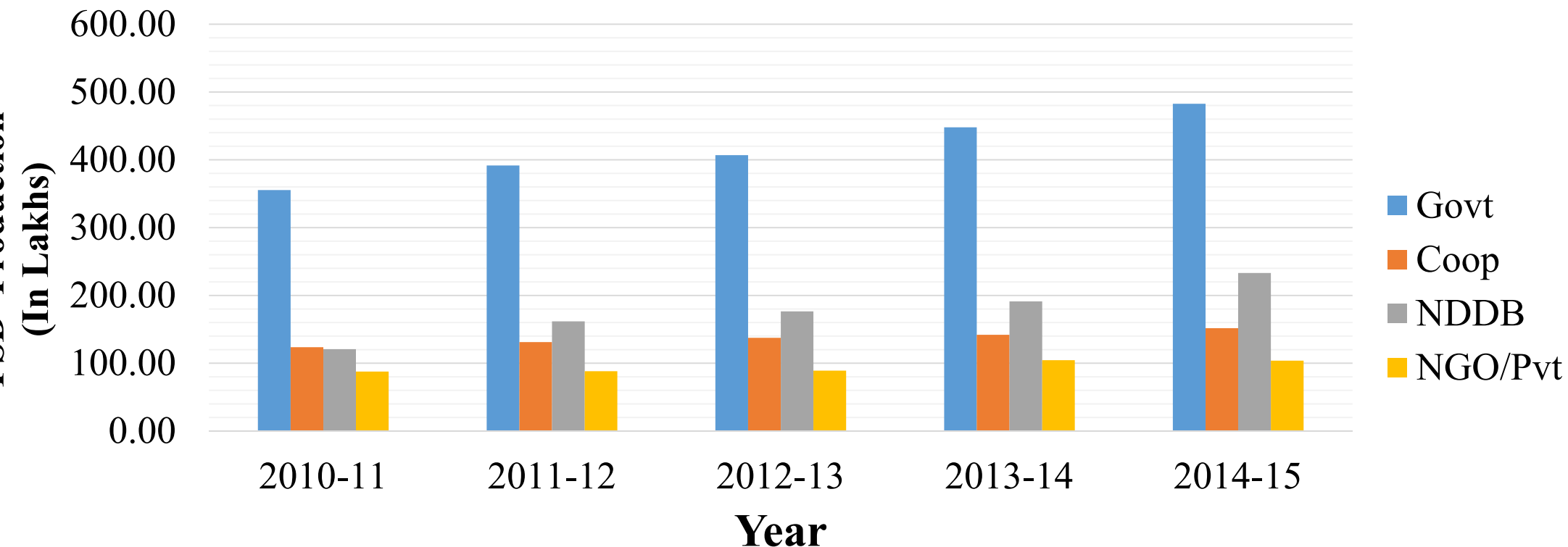
Frozen Semen dose (FSD) Production in the Country

(Data presented is collected and compiled from related agencies every year by NDDB)

emen Production Scenario (doses in Lakhs)

Agency Type	2010-11	2011-12	2012-13	2013-14	2014-15
Government	355.41	391.59	406.83	447.96	480.00
Cooperative	123.72	131.11	137.47	141.96	150.00
NDDB Managed	120.76	161.80	176.56	191.17	230.00
GO/Pvt.	87.80	88.24	89.14	104.46	100.00
Total	667.69	772.74	810.00	885.55	970.00

FSD production by different agencies



Percentage Contribution in total semen production (2014-15)

- Government – 50%
- Cooperative – 16%
- NDDDB – 24%
- NGO (BAIF)/Pvt.(Chitale) – 11%

Proportion of semen production and productivity per bull

Category	2010-11	2011-12	2012-13	2013-14	2014-15
Male (FSDs in Lakhs)	459.19	532.7	562.78	568.45	650.00
Female (FSDs in Lakhs)	208.5	240.04	247.22	317.1	310.00
Total (FSDs in Lakhs)	667.69	772.74	810.00	885.55	960.00
Bulls under collection (No.)	2,780	3,129	3,250	3,409	3,500
Per bull productivity (No. FSDs)	24,018	24,696	24,923	25,977	27,429

Productivity per Bull (No. of FSDs)

Agencies	2010-11	2011-12	2012-13	2013-14	2014-15
Government	20,316	20,941	21,036	23,930	23,930
Cooperatives	25,248	25,758	25,695	27,999	28,000
NDB Dairy Services	33,639	36,116	36,180	34,507	34,507
Public & Private	31,357	29,219	30,424	33,374	33,374

States producing highest cattle FSDs (FSDs in Lakhs)

Rank	2010-11	2011-12	2012-13	2013-14	2014-15
Rank 1	Gujarat	Gujarat	Gujarat	Gujarat	Gujarat
	77.99	99.79	106.86	113.22	120.35
Rank 2	Maharashtra	Maharashtra	Maharashtra	Maharashtra	Maharashtra
	68.06	74.85	78.21	82.78	87.12
Rank 3	Karnataka	Karnataka	Karnataka	Tamil Nadu	Tamil Nadu
	60.86	64.40	66.61	61.07	63.25
Rank 4	Tamil Nadu	Uttar Pradesh	Tamil Nadu	Uttar Pradesh	Karnataka
	50.08	52.90	61.18	58.57	55.42
Rank 5	Uttar Pradesh	Tamil Nadu	Uttar Pradesh	Karnataka	Uttar Pradesh
	40.55	52.81	56.68	48.15	45.32

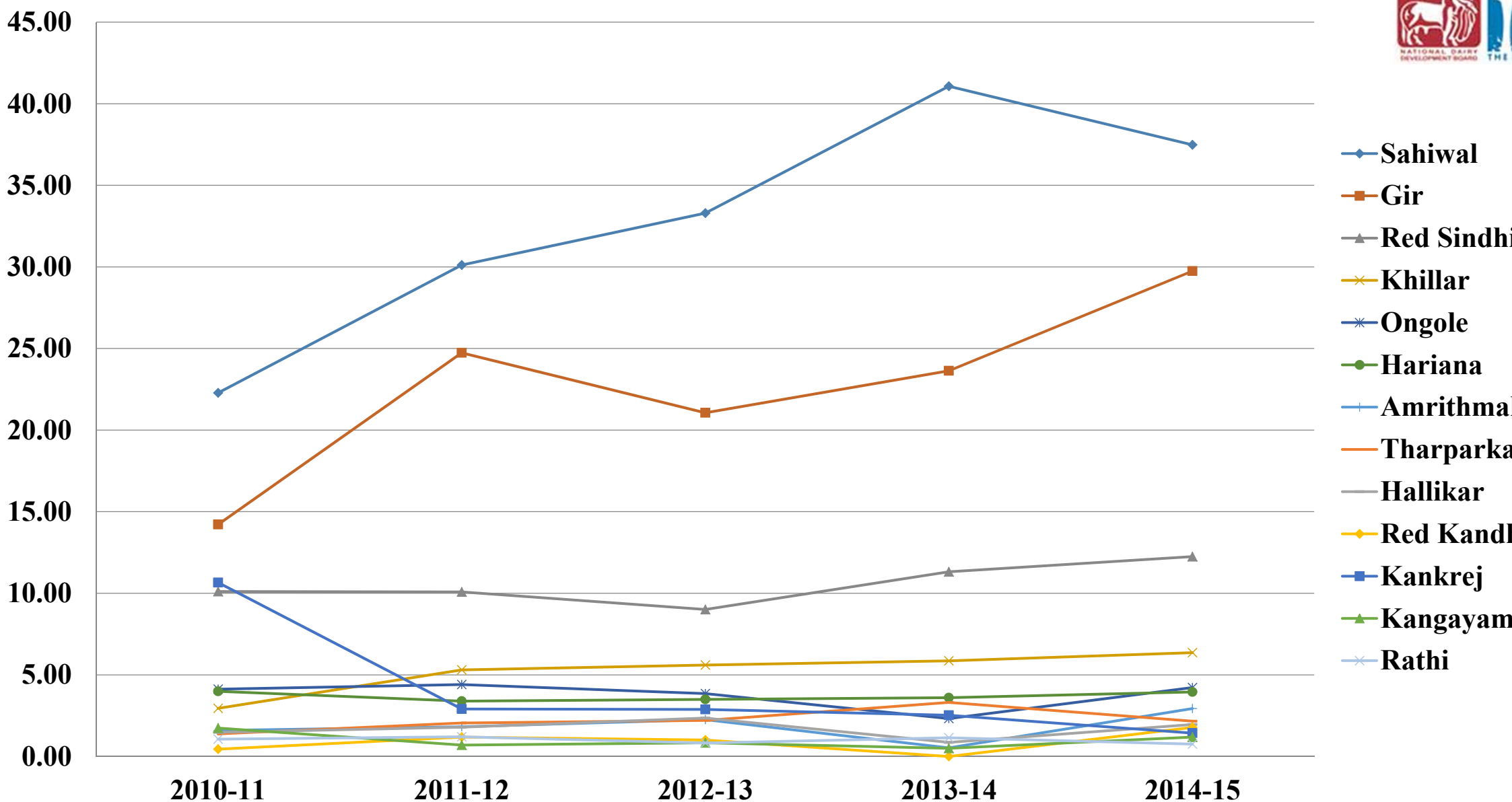
States producing highest buffalo FSDs (FSDs in Lakhs)

Rank	2010-11	2011-12	2012-13	2013-14	2014-15
Rank 1	Gujarat	Gujarat	Gujarat	Gujarat	Gujarat
	50.07	61.28	62.14	75.67	80.12
Rank 2	Andhra Pradesh	Andhra Pradesh	Maharashtra	Maharashtra	Haryana
	40.83	35.76	35.82	55.28	50.12
Rank 3	Maharashtra	Maharashtra	Haryana	Haryana	Maharashtra
	31.84	32.38	33.73	43.28	45.12
Rank 4	Punjab	Haryana	Andhra Pradesh	Andhra Pradesh	Andhra Pradesh
	18.42	28.65	29.57	25.85	25.12
Rank 5	Haryana	Uttar Pradesh	Uttar Pradesh	Uttar Pradesh	Uttar Pradesh
	17.47	21.82	21.73	25.27	25.12

ghest FSDs produced by semen stations (FSDs in Lakhs)

Position	2010-11	2011-12	2012-13	2013-14	2014-15
Rank 1	SAG	SAG	SAG	SAG	SAG
	80.51	102.61	112.14	120.93	120.93
Rank 2	BAIF	BAIF	BAIF	BAIF	BAIF
	75.62	72.23	71.25	80.15	80.15
Rank 3	ABC	ABC	ABC	ABC	ABC
	40.25	58.82	62.72	64.86	64.86
Rank 4	NSS	NSS	NSS	NSS	Echen
	28.99	30.23	35.39	37.03	37.03
Rank 5	Nabha	Nabha	Echenkottai	Hissar	Hissar
	27.71	29.2	30.66	33.75	33.75

Semen Production of Major Indigenous Breeds



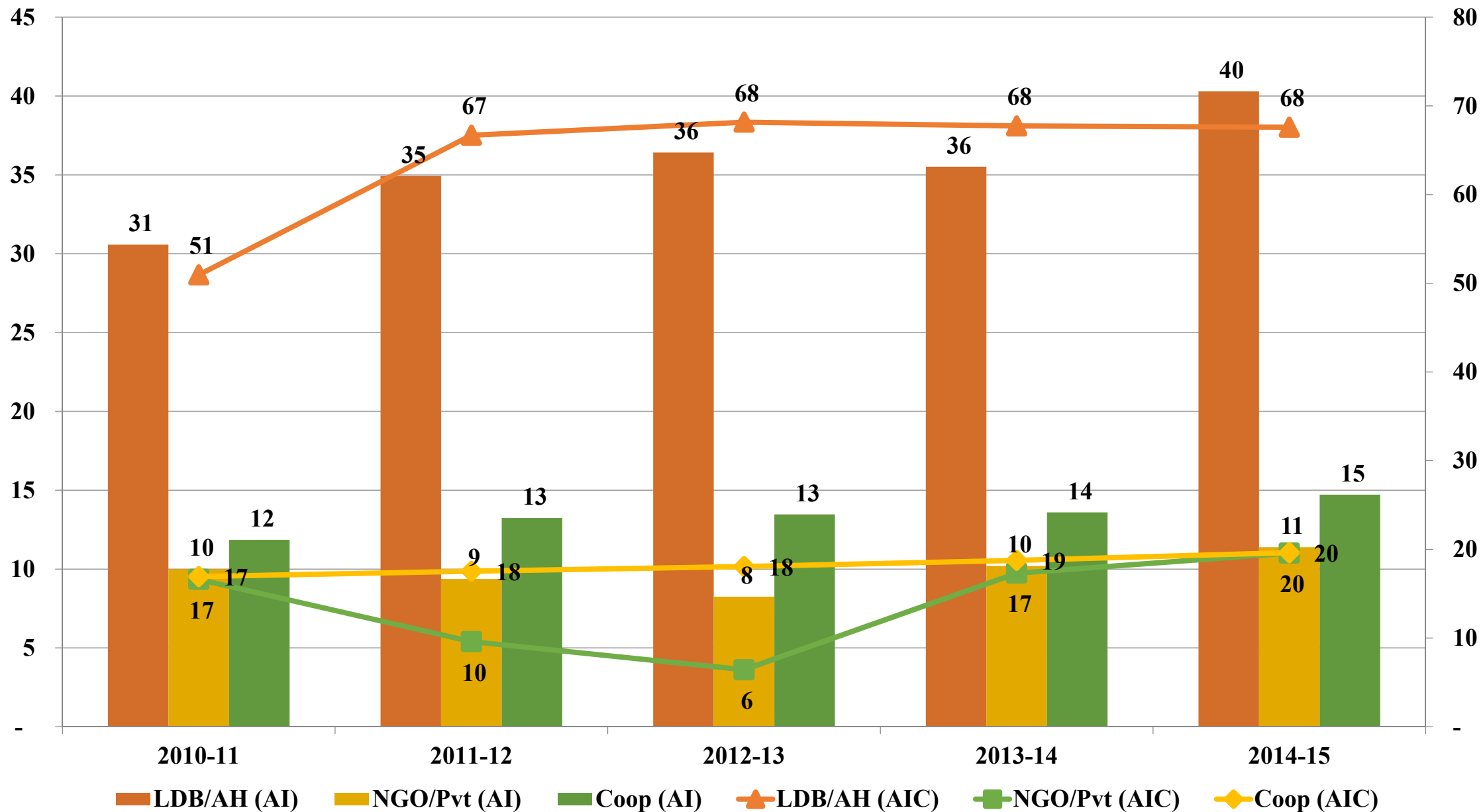
Percent of FSDs produced by A & B graded semen stations and C & D graded semen stations

Grade of Semen Station	Criteria	2010-11	2011-12	2012-13	2013-14	2014-15
A & B graded	FSDs produced (FSDs in Lakhs)	478.8	615.06	726.38	851.02	961.02
	% Share	72%	79%	90%	96.1%	96.1%
	No of Semen Stations	37	37	37	44	44
C & D Not-graded	FSDs produced (FSDs in Lakhs)	188.9	157.68	83.62	34.53	34.53
	% Share	28%	21%	10%	3.9%	3.9%



Artificial Insemination (AI) Delivery activities in the Country

Agency wise: Artificial Inseminations & Centers



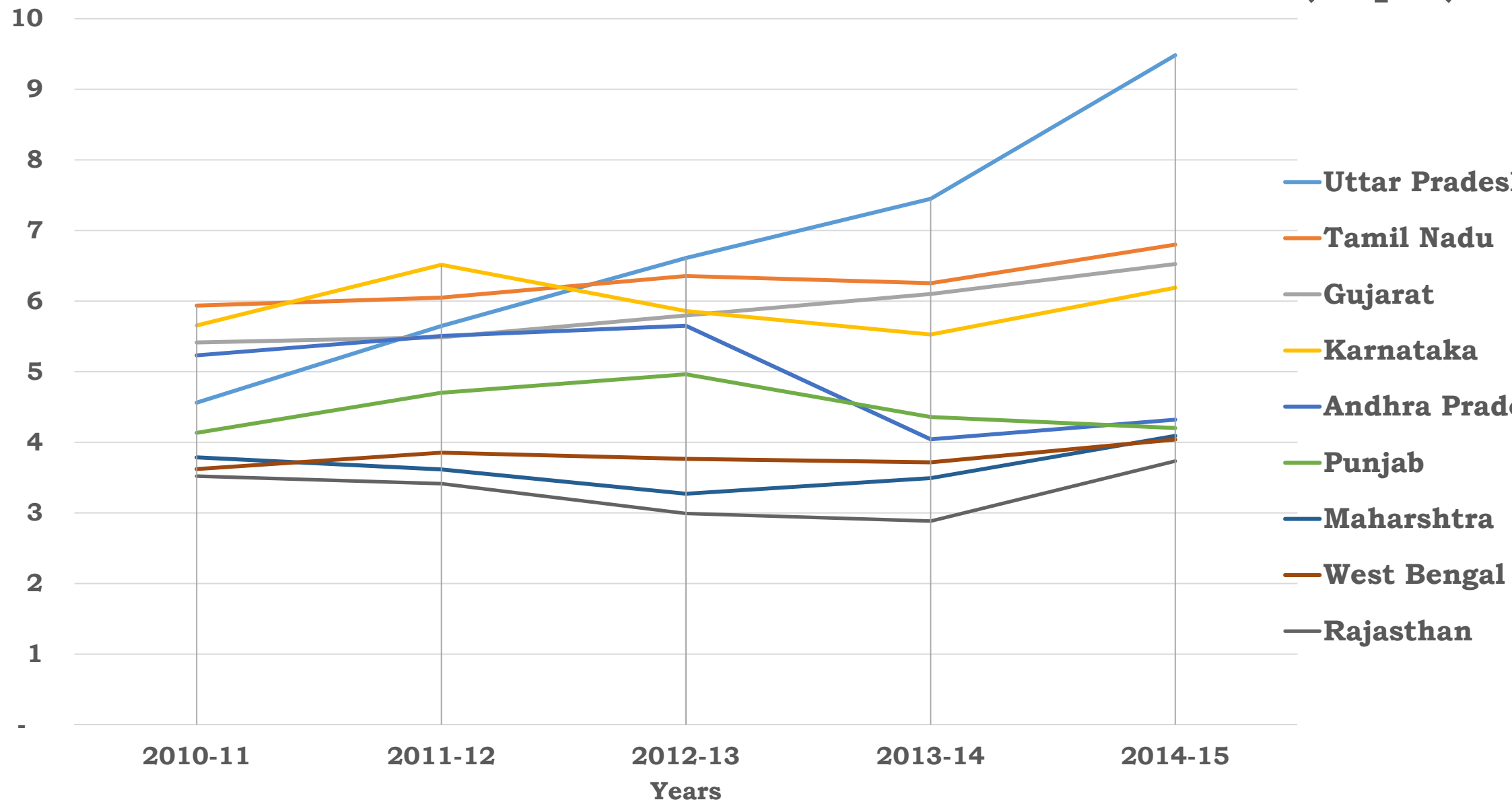


State Wise Comparison of AI Activities

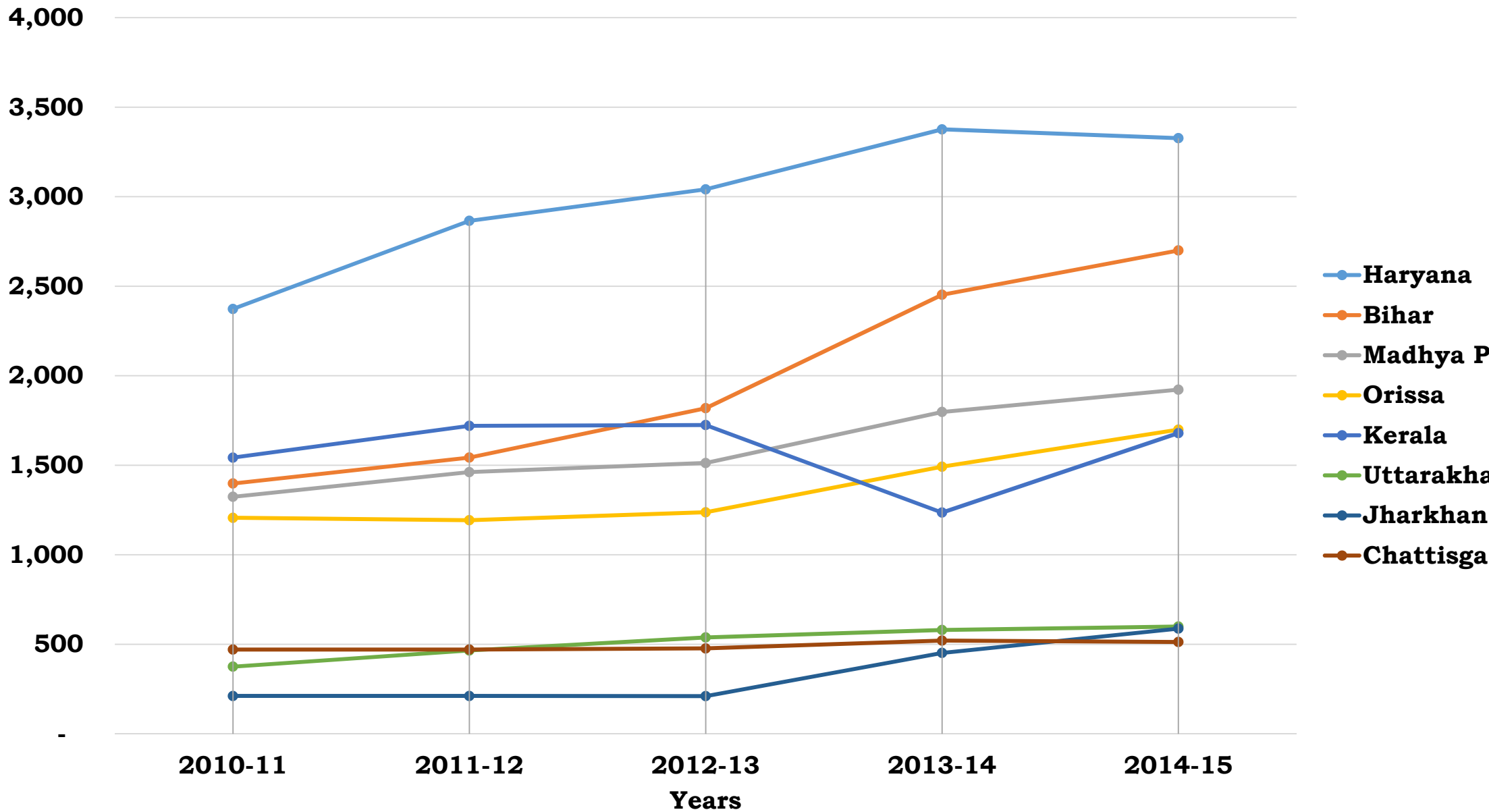
2014-15

Union Territories and North-east states have been excluded for comparison due to very low bovine population.

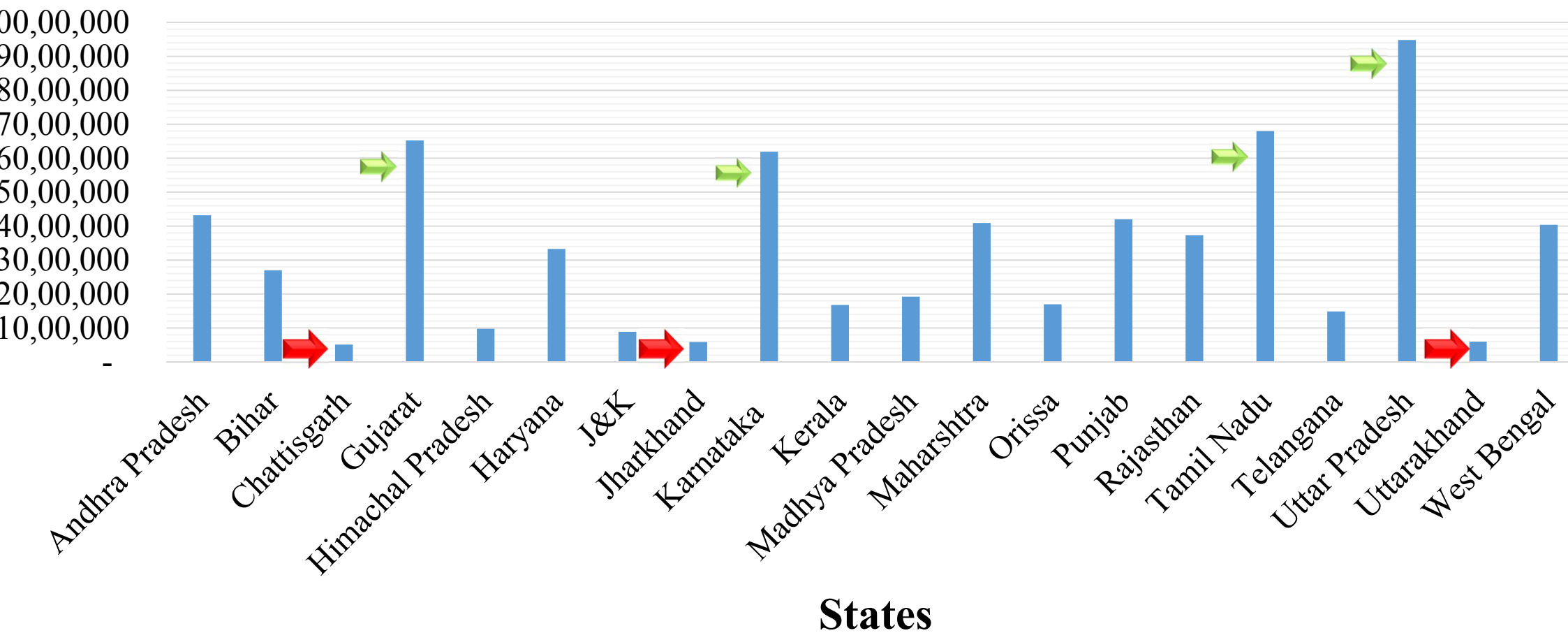
State wise Trend: Artificial Inseminations (Top 9)



State wise Trend: Artificial Inseminations (Bottom 8)

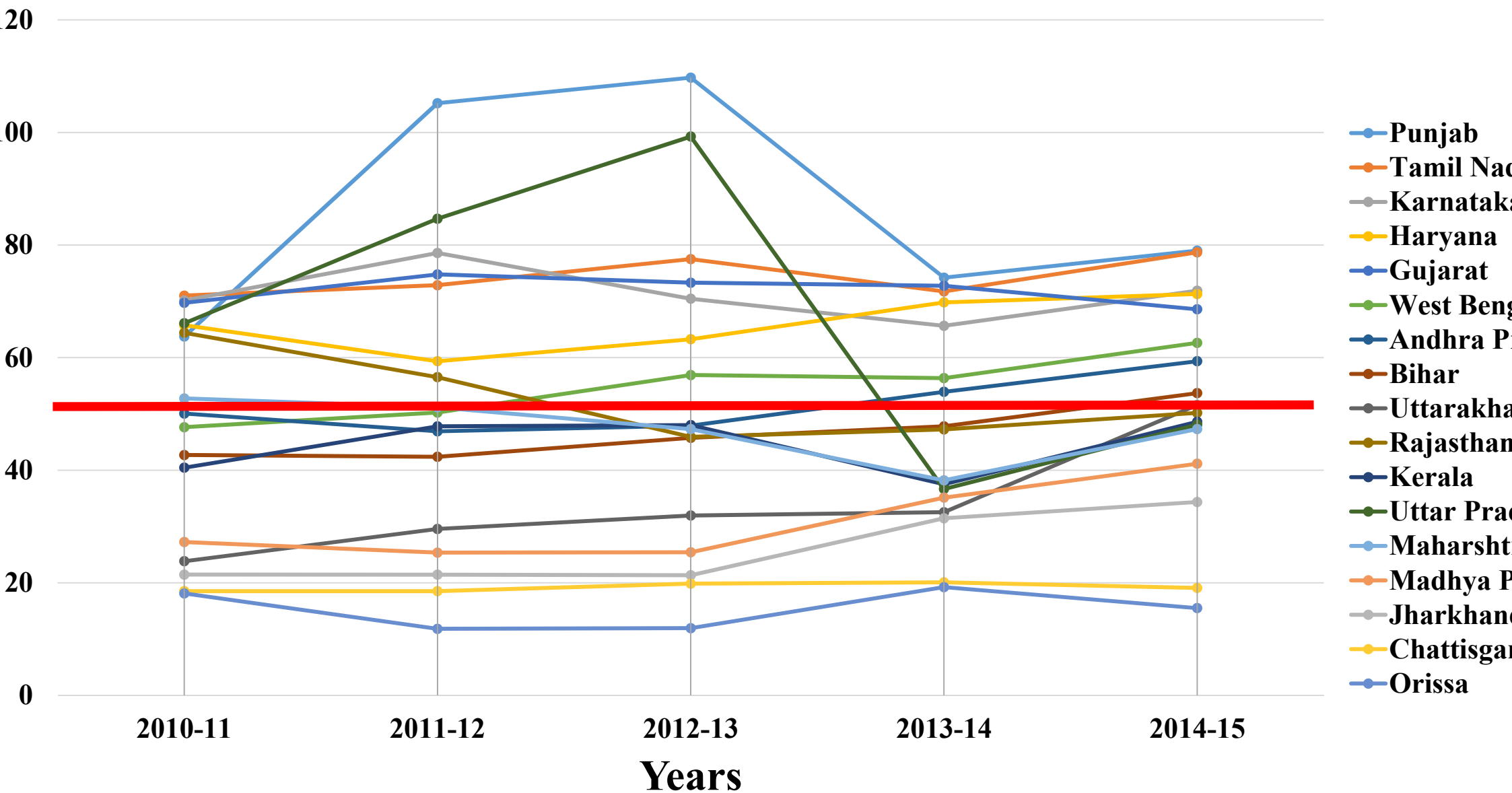


Done

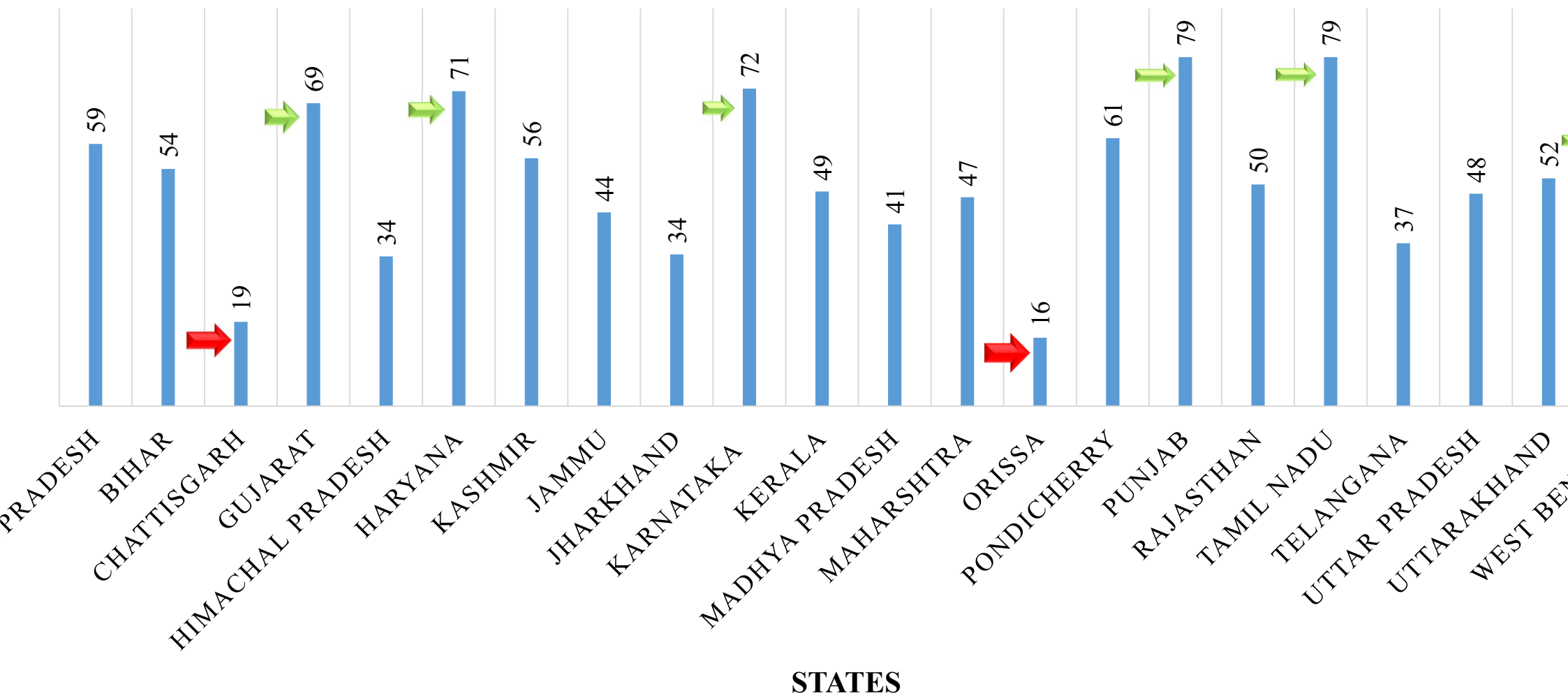


AI Done by State Live Stock Development Boards/ Animal Husbandry Department, Non-Governmental/ Private Organisations and Cooperatives

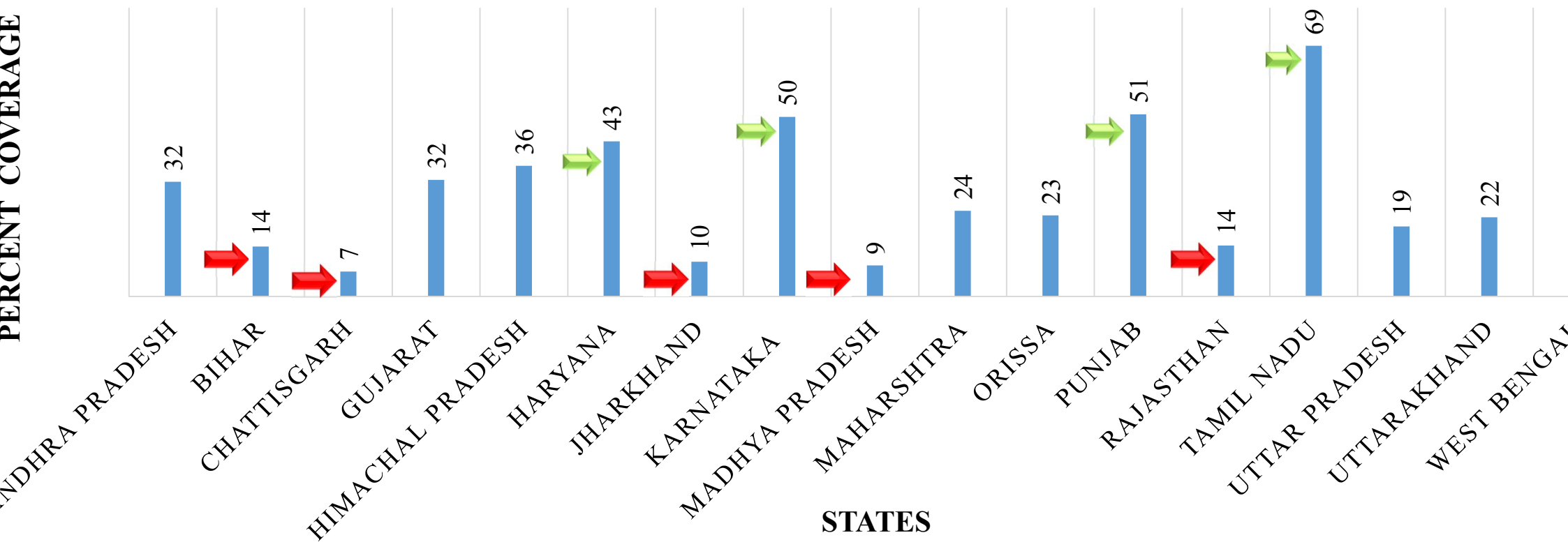
State wise trend _AIPCPM (Country's Average: 52)



Per Centre Per Month (AIPCPM) – of AIs done by an AI Technician in one month



Percent Coverage of Breedable Bovine Population



Percent Coverage -

Bovine population covered through AI

Breedable Bovine Population -

Bovine population fit for performing AI (~70%)

Country's Average – 25%

AI Done in Cattle and Buffalo

AI Done in Cattle	
More than 95%	West Bengal (99%), Kerala (99%), Odisha (98%), Tamil Nadu (95%) and Jharkhand (95%), all North East States (95 to 100%)
60% to 80%	Chhattisgarh (85%), Karnataka (84%), Bihar (80%), Uttarakhand (70%) and Uttar Pradesh (60%)
50% to 60%	Rajasthan (56%), Maharashtra (56%), Punjab (55%)
AI Done in Buffalo	
More than 50%	Telangana (74%), Haryana (71%), Andhra Pradesh (57%), Gujarat (52%)
States with highest %coverage of Cattle Population	States with highest %coverage of Buffalo Population
Punjab (90%)	Tamil Nadu (41%)
Tamil Nadu (72%)	Haryana (39%)
Karnataka (62%)	Punjab (33%)
Haryana (58%)	Andhra Pradesh (31%)
Gujarat (37%)	Gujarat (29%)
Country's Average – 30%	Country's Average – 18%

State wise analysis_2014-15



AIPCPM	AI Done	Percent Coverage
Punjab/ Tamil Nadu (79)	Uttar Pradesh (95 Lakhs)	Tamil Nadu (69)
Karnataka (72)	Tamil Nadu (68 Lakhs)	Punjab (51)
Haryana (71)	Gujarat (65 Lakhs)	Karnataka (50)
Gujarat (69)	Karnataka (62 Lakhs)	Haryana (43)
Chhattisgarh (19)	Uttarakhand (5.99 Lakhs)	Bihar/Rajasthan (14)
Odisha (16)	Jharkhand (5.87 Lakhs)	Jharkhand (10)
	Chhattisgarh (5.12 Lakhs)	Madhya Pradesh (9)
		Chhattisgarh (7)

Tamil Nadu represents best performance in all the three parameters among all the states followed by **Karnataka**
Uttar Pradesh is the **largest milk producer** and carries **highest no. of AI** but percent coverage (19) is very low
Chhattisgarh shows poor performance for all the parameters
Odisha has lowest AIPCPM, No. of AICs is very high.

Rest of the states shows average performance with AIPCPM ranging from **30 to 50**, AI done from **10 to 40 Lakhs** and percent Coverage from **20 to 35**.

Key Policy Interventions



- Minimum Standards (MS) for Frozen Semen Dose (FSD) production
- Standard Operating Procedures (SOP)
- Periodic evaluation of semen stations through Central Monitoring Unit (CMU)
- Enforcement of area specific Breeding Policy
- Adoption of unique Animal Identification system (Pashu Aadhar). Use of common INAPH* information system for program implementation and data analysis.
- Training and Capacity Building
- De-notification of AI delivery services from Minor Veterinary Services (MVS)
- Enactment of Bovine Breeding Bill circulated by DADF, GoI, in 2011 (at least 3 states)

*INAPH-Information Network on Animal Productivity and Health

Conclusion

- Frozen Semen Doses should be purchased only from A and B graded semen stations
- MS for frozen semen and bull production and SOP for delivering AI services and bull production should be diligently followed as stipulated by DADF, GoI
- Area specific Breeding Policy of the state should be adhered to



Thank You

National Dairy Development Board, Anand

Sahiwal







Rathi



Kankrej

Haryana Bull





Mehsani

Pandharpuri



Nili Ravi



[Back](#)

TOPICS

- Refresher training
- Quality Control
- Minor Veterinary Services
- Expansion of AI centres
- Strengthening of AI Centres
- Data_demand for milk till 2050

Analysis Contd.

- Tamil Nadu has maintained good AIPCPM (72; highest for 2014-15) constantly over 5 years
- Orissa are the have lowest AIPCPM constantly over last 5 years followed by Chhattisgarh.

Punjab			
	AI Centres	AI Done	AIPCPM
2010-11	5,404	41.34	64
2011-12	3,724	47.01	105
2012-13	3,769	49.63	110
2013-14	4,894	43.6	74
2014-15	4,431	42.01	79

Uttar Pradesh			
	AI Centres	AI Done	AIPCPM
2010-11	5,750	45.61	66
2011-12	5,557	56.46	85
2012-13	5,549	66.1	99
2013-14	16,933	74.48	37
2014-15	16,434	94.82	48

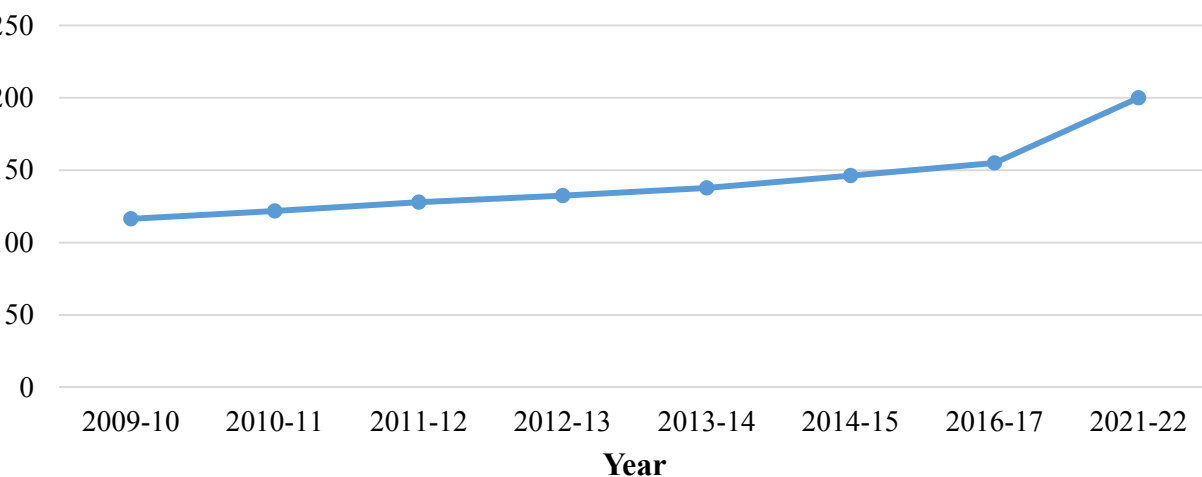
Productivity per bull (*Will ask for figures for 2013-14*)*

Category	2010-11	2011-12	2012-13	2013-14	2014-15
Exotic	27,642	28,566	29,672	*	32,000
Crossbreds	23,907	24,977	26,184	*	26,000
Indigenous	20,661	21,658	21,710	*	24,000
Calves	21,167	22,560	21,497	*	23,000
Total bull productivity (No. SDs)	24,018	24,696	24,923	25,977	27,000

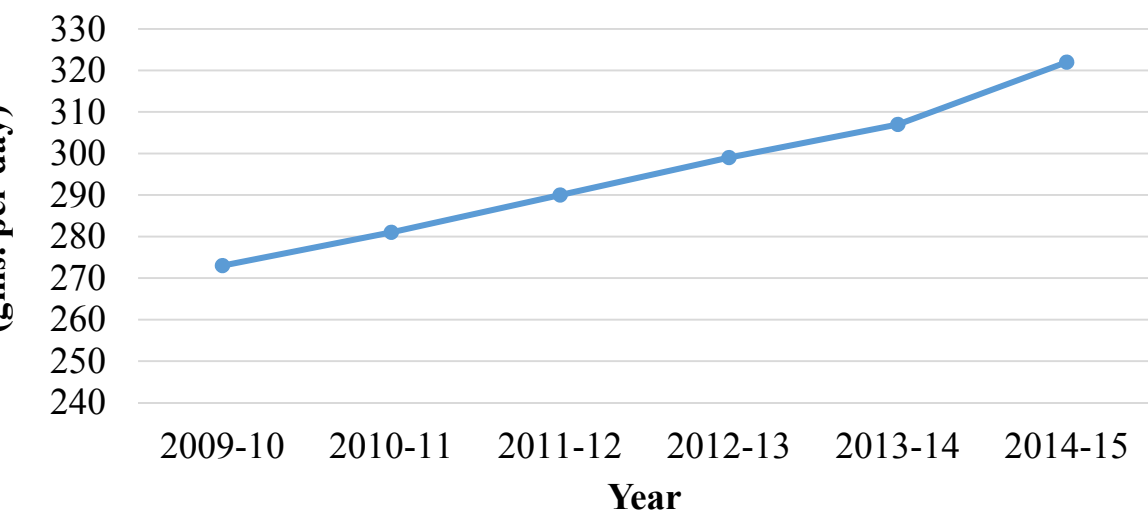
Trend in bovine population, productivity and production

Particulars	1992	1997	2003	2007	Annual Growth 1992-2007
Female Animals (In million)					
Local Cows	57.87	55.08	52.21	56.76	
Crossbred cows	6.44	9.35	12.3	16.16	
Buffaloes	43.81	46.77	50.97	54.47	
Male Animals (In million)					
Local Cows	27.55	23.36	27.63	30.68	
Crossbred cows	4.01	5.93	8.18	10.72	
Buffaloes	25.89	28.41	33.32	35.64	
Milk yield per day per Animal (In kgs.)					
Local Cows	1.50	1.83	1.92	2.10	
Crossbred cows	6.68	6.36	6.53	6.52	
Buffaloes	3.12	3.83	4.24	4.44	
Milk Production (in million MT)					
Local Cows	15.23	18.00	19.66	21.74	
Crossbred cows	9.11	12.03	16.32	21.74	
Buffaloes	31.09	38.98	48.38	58.91	
Goats	2.59	3.12	3.80	3.89	
Total	58.01	72.13	88.16	104.89	

Milk production and per capita availability of milk



Year	Milk Production (Million Tonnes)
2009-10	116.4
2010-11	121.8
2011-12	127.9
2012-13	132.4
2013-14	137.7
2014-15	146.3
2016-17	155 (Projected)
2021-22	200 (Projected)



Year	Per Capita Availability of milk (gm per day)
2009-10	273
2010-11	281
2011-12	290
2012-13	299
2013-14	307
2014-15	322