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National Action Plan on Fodder & Feed Security Programme

1. Background

1.1 The country is largest producer of milk in the world (19% of world's milk production in 2015) targeted to produce 300 million ton by 2024. This is sought to be achieved by higher bovine productivity through genetic improvement, better disease control and higher as well as balanced fodder availability. In this context, it is to be noted that the country also faces drought and flood which impact on the productivity and sustenance of livestock because, the milch animal's productivity as also that of small ruminants like goat and sheep reduces drastically due to lack of fodder, feed and drinking water. Distress sale or even abandonment is often the only other alternative.

1.2 In fact, the contribution of feed and fodder is upto 50% towards livestock productivity and production. The cereals crop residues i.e. wheat, rice and coarse cereals straws / hay contribute about 71% of overall feed resources used for animal feeding, green fodder 23% and concentrated feeds accounts 6% only. At present, there is no Feed and Fodder Security for more than 500 million animals in the country. This becomes important as, recent times, livestock production is changing from sustenance to agri-business in the form of enterprises and industries based on milk, meat, egg and other livestock products, due to doubling of its contribution to Agriculture GDP from 14 % to 26.5 % between 1980 to 2016 as compared to halving of Agriculture GDP share in National GDP from 34 % to 17% in the same period.

1.3 The most fundamental and basic area of concern is the management of the major land feeding resources for fodder cultivation for livestock. These include pasturelands, crop residues, edible weeds, grasses, cultivated fodder, tree leaves and agro-industrial by-products. As per estimates of Directorate of Economic & Statistics, Department of Agriculture, Co-operation and Farmers Welfare, Government of India, fodder crops are cultivated only in about 4.9% (9.13 m ha) of the gross cropped area of the country and this area has been static for last 25 years. Further, there exist wide variations in the different estimates of fodder and feed requirement. However, all such estimates project significant deficit of green and dry fodder and the concentrates.

1.4 NITI Aayog in their Three Year Action Agenda 2017-2020 emphasized on shift into High Value have Commodities, have indicated that an important challenge in the

development of animal husbandry **concerns fodder availability. Further, that the** rapidly growing numbers of unproductive male cattle would add weak to the problem due to already existing weak fodder base due to problems in pasture management and shrinking of common properties which make the problem doubly serious. We therefore need innovation in institutional aspects of pasture protection and management. Also necessary is greater **co-ordination between agencies responsible for livestock and those for production of crops that produce fodder.**

1.5 The small marginal farmers own only 44% of the agricultural land while they own over 80% livestock asset. Quite logically, therefore, if the income of the farmer is to be doubled by 2022 as per vision given by Hon'ble Prime Minister in 2016, then livestock is perhaps the best and most available asset to enhance farmers income due to higher availability of the livestock as compared to land as an asset for income generation. Besides, over the years, landholdings in India have become smaller and fragmented. According to the 2010-11 Agriculture Census, 47% of land holdings had become less than half a hectare in size. These holdings are thus too small to support even a family of five. As a result, many farmers now seek alternative sources of income. Stringent tenancy laws in most of the States discourage such farmers hesitate to lease their unproductive land holding and as a result, an increasing amount of farmland is left fallow. The introduction of a modern land leasing law that balances and protects right of tenant and landowner could be a potential solution. In such leased farm land, the fodder along with milk production activities could be a good substitute. Additional fodder areas would also enable more income. It may be noted that the GVA of milk is 37% more than wheat & rice GVA output put together (2015-16). Thus such investments would be doubly rewarded with higher income.

2. Estimates on Demand and Supply of Fodder & Feed

2.1 The overall productivity of livestock has been low in past, because of inadequate nutrition from green fodder, along with dry residue and protein concentrate. As per NIANP –ICAR estimate, there is shortage **of up to 36 % of Green fodder and protein concentrates besides upto 23% shortage of dry fodder.** The green fodder shortage is due to impact of dwarf high yielding cereals crops (less short stock verses grains and hence less fodder material) apart from encroachment of over 10 million hectares of pasture land with poor replacement by agriculture land. The short length

dual hybrid cereal crops also impact this availability. The problem is further compounded by lack of focus on scientific growth of fodder including required agro-climatic varieties in over 105 arid and drought prone districts even while there is burning of available crop residues in fodder surplus States like Punjab and Haryana year after year. As a result, the cost of fodder is increasing at a much faster rate than price of milk thereby reducing profitability at the farmers level. The overall productivity of Dairy cattle is thus low because of inadequate nutrition from green fodder, along with dry residue and protein concentrate.

2.2 The 34th report of Parliamentary Standing Committee on Agriculture has also indicated shortage of 122 million ton dry fodder, 284 million ton of green fodder and 35 million ton of concentrate by 2020. The detail of supply and demand of Fodder and Feed is as under:-

(Dry matter in Million tonnes)

Type of Fodder	Parameters	2015	2020	2025
Dry Fodder	Requirement	491	530	550
	Availability	387	408	433
	Deficit (%)*	104(21%)	122(23%)	117 (23%)
Green Fodder	Requirement	840	880	1000
	Availability	619	596	600
	Deficit (%)*	221 (26%)	284(32%)	400 (40%)
Concentrate	Requirement	87	96	105
	Availability	58	61	65
	Deficit (%)*	29 (34%)	35 (36%)	40 (38%)

* Deficit in percentage.

2.3 **The IGFRI, Jhansi in its Vision- 2050** has indicated estimated fodder shortage in context of fodder supply and demand on the basis of livestock population as under:-

Projected livestock population estimates* (million Adult Cattle Unit, ACU[#])

Year	Cattle	Buffalo	Sheep	Goat	Equine	Camel	Total
2010	127.31	88.88	4.66	9.03	0.75	0.49	231.10
2020	129.16	95.31	5.03	10.32	0.63	0.43	240.86
2030	133.66	106.87	5.39	11.18	0.54	0.29	257.93
2040	136.69	115.08	5.76	11.99	0.40	0.20	270.14
2050	139.63	127.16	6.13	13.19	0.29	0.12	286.52

* Estimates based on past Livestock censuses published by the Directorate of Economic & Statistics and Department of Animal Husbandry & Dairying.

Category-wise population data was multiplied with standard body weight to get total weight while conversion to ACU (1 ACU = 350 kg).

Demand and supply estimates* of dry and green forages (million tonnes)

Year	Demand		Supply		Deficit		Deficit as %	
	Dry	Green	Dry	Green	Dry	Green	Dry	Green
2010	508.99	816.83	453.28	525.51	55.72	291.32	10.95	35.66
2020	530.50	851.34	467.65	590.42	62.85	260.92	11.85	30.65
2030	568.10	911.67	500.03	687.46	68.07	224.21	11.98	24.59
2040	594.97	954.81	524.40	761.76	70.57	193.05	11.86	20.22
2050	631.05	1012.70	547.78	826.05	83.27	186.65	13.20	18.43

* Assumptions:

For calculation of demand of dry and green forages, concentrate feed's data were adopted from article 'India's livestock feed demand: Estimates and projections. Dikshit, AK, and PS BIRTHAL. 2010. Agricultural Economics Research Review, 23(1): 15-28'. Green forage, dry forage and concentrate feed were converted into dry matter (DM) applying a factor of 0.25, 0.90 and 0.90, respectively.

Area under fodder crop and pastures were extrapolated. Supply of green fodder was calculated using a factor of 60 to 70 t/ha for cultivated areas; for pasture sources, a factor of 1.2 to 1.5 t/ha was used for green forage supply.

These estimates of feed demand are built upon the actual feed consumption rates obtained from a nationally representative household survey; hence are more credible.

3. Challenges of Fodder Development

3.1 India has only 2.29% of the total land area of world and hosts 17% of the human population and 11% of the total livestock population of the world. The area under fodder production in India is stagnating at 4% of the gross cropped area for the last four decades. India is the highest milk producer country in the world but milk production per animal per year is very low. Deficiency in quantity and quality of fodder is one of the major causes for this low animal productivity. The animals need proper feeding to meet their nutrient requirement to express their full genetic production potential. Deficiency of green forage is mainly due to non-availability of land for fodder cultivation. Fodders are again cultivated or grown naturally on degraded and marginal lands with minimum input, in terms of fertilizers, water and operational energy. Moreover, in case of forages, regional and seasonal deficiencies are more important than the national deficiencies, as it is not economical to transport the forage over long distances.

3.2 The forage resource development is a more complex issue than food and commercial crops. Lack of momentum in fodder development in the country owes

much also to poor organizational structure. Keeping in view the huge livestock population and their nutritional security, the gross cropped area under fodder cultivation should be increased.

3.3 Shortage of fodder is ordinarily observed during lean period which is more conspicuous in the flood & drought situation. Except preservation of crop residues in the forms of stalks at farmer level, the other preservation practices in the form of silage bales, fodder blocks, etc., are totally absent among farmers mainly due to lack of awareness about preservation techniques. Most of the crop residues are stored as dry fodder in the form of stalks.

4. Regional imbalances in fodder availability

The pattern of deficit varies in different parts of the country. For instance, the green fodder availability in Western Himalayan, Upper Gangetic Plains and Eastern Plateau and Hilly Zones is more than 60% of the actual requirement. In Trans Gangetic Plains, the feed availability is between 40 and 60% of the requirement and in the remaining zones, the figure is below 40%. In case of dry fodder, availability is over 60% in the Eastern Himalayan, Middle Gangetic Plains, Upper Gangetic Plains, East Coast Plains and Hilly Zones. In Trans Gangetic Plains, Eastern Plateau and Hills and Central Plateau and Hills, the availability is in the range of 40-60%, while in the remaining zones of the country the availability is below 40%. Fodder scenario in India is depicted at Map -1.

5. Area under fodder production

5.1 Fodder crops are the plant species that are cultivated and harvested for feeding the animals in the form of forage (cut green and fed fresh), silage (preserved under anaerobic condition) and hay (dehydrated green fodder). The total area under cultivated fodders is around 9.13 million ha on individual crop basis. Sorghum amongst the *kharif* crops (2.6 million ha) and berseem (Egyptian clover) amongst the *rabi* crops (1.9 million ha) occupy about 54% of the total cultivated fodder cropped area. The area under permanent pastures has been declining over the years and the trend could well continue in the future. Due to overgrazing, and more importantly blatant encroachment, the land area availability and productivity of the pastures has been declining too. The area under fodder crops has almost remained static.

S. N.	Fodder crops	Areas in '000'ha	Green fodder productivity (tonnes/ha)
1	Berseem(Egyptian clover)	1,900	60-110
2	Lucerne (Alfalfa)	1,000	60-130
3	Senji (Sweet clover)	5	20-30
4	Shaftal (Persian clover)	5	50-75
5	Metha (Fenugreek)	5	20-35
6	Lobia (Cowpea)	300	25-45
7	Guar (Cluster bean)	200	15-30
8	Rice bean	20	15-30
9	Jai (Oat)	100	35-50
10	Jau (Barley)	10	25-40
11	Jowar/ Chari(Sorghum)	2,600	35-70
12	Bajra (Pearl millet)	900	20-35
13	Makka (Maize)	900	30-35
14	Makchari (Teosinte)	10	30-50
15	Charasarson (Chinese cabbage)	10	15-35

Source: Hand Book of Agriculture, 2011

5.2 Sizeable amount of fodder demand is fulfilled through vast grasslands and rangelands any positive or negative change in its position will have impact on several environmental issues. Similarly, the increase in livestock population will also affect the availability of organic wastes which in turn can boost the agricultural production.

S. N.	Resources	Areas in million ha.
1	Forests	69.41
2	Permanent pastures/grazing lands	10.24
3	Cultivable wastelands	13.66
4	Fallow lands	24.99
5	Fallow land other than current fallows	10.19
6	Barren uncultivable wastelands	19.26
7	Total common property resources other than forests	54.01

Source: Hand Book of Agriculture, 2011

5.3 India has an area of 10.24 million ha land under permanent pasture and other grazing lands categories during 2012-13. Rajasthan state with 1.69 m ha land under permanent pasture and other grazing lands has largest areas (16.54%) (Agriculture Statistics at a Glance, 2015). In addition to that Himachal Pradesh, Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Odisha Andhra Pradesh and Maharashtra states have significant area under this category. The state wise details are under.

State wise areas under permanent pasture and other grazing land (2012-13) (in thousand ha)

S.N.	States	Areas	Percent	Ranking
1	Andhra Pradesh	515	5.03	9
2	Chhattisgarh	861	8.41	6
3	Gujarat	851	8.31	7
4	Karnataka	908	8.87	5
5	Madhya Pradesh	1286	12.56	3
6	Maharashtra	1245	12.16	4
7	Rajasthan	1694	16.54	1
8	Himachal Pradesh	1508	14.73	2
9	Jammu & Kashmir	114	1.11	10
10	Odisha	536	5.23	8
	Sub Total	9518	92.95	
	Other States	722	7.05	
	Total	10240	100	

Source: Directorate of Economics & Statistics, DoAC & FW

5.4 The pasture lands available in the different states are overgrazed and not properly managed which lead to lower productivity. In different states, grazing pressure on this land is very high compared to carrying capacity. About 70% of grazing land comes under poor to very poor condition in Rajasthan having productivity below 500 kg / ha with carrying capacity of 0.13 ACU / ha.

6. Ongoing programmes of DAD&F

6.1 The Department of Animal Husbandry, Dairying and Fisheries (DADF) Government of India is implementing Centrally Sponsored National Livestock Mission with a Sub Mission on Feed and Fodder Development since 2014-15. Under the Sub Mission financial assistance is provided to the Animal Husbandry Departments of the States/UTs for feed and fodder development under the following components :

S. N.	Name of the Components
1.	Fodder Production from Non-forest wasteland/rangeland/grassland/non-arable land
2.	Fodder production from Forest land
3.	Fodder Seed Procurement/ Production & Distribution
4.	Introduction of Hand Driven Chaff-Cutter
5.	Introduction of Power Driven Chaff-Cutter
6.	Distribution of low capacity, tractor mountable Fodder Block Making units, hay baling machines/reapers/forage harvesters
7.	Establishment of silage making Units
8.	Establishment of by-pass protein production units

9.	Establishment of Area Specific Mineral Mixture / Feed Pelletting/ Feed Manufacturing Unit.
10	Establishment/modernization of Feed Testing Laboratories

6.2 State wise release of funds under Sub Mission Feed and Fodder of National Livestock Mission during 2014-15, 2015-16 & 2016-17

(Rs in Lakhs)

State & UTs	2014-15	2015-16	2016-17
Andaman & Nicobar	NA	NA	2.25
Andhra Pradesh	NA	NA	558.00
Bihar	343.00	NA	
Chhattisgarh	NA	212.61	41.57
Gujarat	1,500.00	NA	1095.83
Haryana	490.00	NA	
Himachal Pradesh	74.99	NA	
Jharkhand	500.00	NA	200.00
Karnataka	NA	422.00	1.04255
Maharashtra	157.14	500.00	1338.205
Nagaland	39.94	23.25	
Odisha	178.50	72.60	131.40
Rajasthan	NA	338.817	177.45
Sikkim	7.65	15.11	
Tamil Nadu	600.00	NA	
Tripura	5.70	NA	
Uttarakhand	NA	101.55	
Uttar Pradesh	321.00	NA	
West Bengal	550.35	NA	27.72
Total	4768.27	1685.937	3573.4675

The varying demand between States in between years within the same State is largely due to demand for allocation, lack of Utilization Certificates, etc.

6.3 Component wise physical progress for all India under NLM

S.N	Component	2014-15	2015-16	2016-17	Total
1	Fodder Production from Non-forest wasteland/rangeland/grassland/non-arable land (ha)	535	NA	715	1250
2	Fodder production from Forest land(ha)	NA	45	100	145
3	Fodder Seed Procurement/ Production & Distribution(Qtls)	46031.1	44778.44	5511.15	96320.69
4	Introduction of Hand Driven Chaff-Cutter(Nos)	21516	3634	600	25750
5	Introduction of Power Driven Chaff-Cutter(Nos)	9307	12331	7522	29160
6	Distribution of low capacity, tractor mountable Fodder Block Making units, hay baling machines/reapers/forage harvesters(Nos)	2	0	0	2
7	Establishment of silage making Units(Nos)	2272	56	1495	3823
8	Establishment of by-pass protein production units(Nos)	3	0	0	3
9	Establishment of Area Specific Mineral Mixture / Feed Pelleting/ Feed Manufacturing Unit.(Nos)	1	0	0	1
10	Establishment/modernization of Feed Testing Laboratories(Nos)	5	0	2	7

7. Role of Regional Fodder Stations

7.1 Regional Fodder Stations are having an area of 600 ha of which 29% area is under irrigation. Now, the Regional Fodder Stations of DADF are reasonably producing Foundation Seeds of desired variety and supply to States who fulfill their foundation seed needs for its further multiplication and distribution as a certified/ quality seeds in the form of minikits. Earlier the Regional Fodder Stations produced seeds which were directly sold / distributed as a minikits to farmers and to the States. These stations are producing seeds of seasonal crops like oats, maize, sorghum, bajra, cowpea and perennial grasses. The seeds production is around 500-600 tons annually as a Foundation Seed and Truthfully Labeled Seeds. Analysis of the data of fodder Station indicate only a few States have procured the Regional Fodder Station's foundation seeds. These are Chhattisgarh, Karnataka, Maharashtra, Rajasthan, Tamil Nadu & Uttarakhand from 2015-1017. The Regional Fodder Stations namely

Bangalore & Kalyani has argued distribution of seeds to the States are more suitable in the form of minikits for its procurement. The grasses which are very precious and farmers procured seeds within week during the season in small quantities packets / kits for cultivation. The seed production and distribution and prices are given in the table

Table –Fodder Seeds produced and Distributed/sold to the States during 2014-15 to 2016-17.

Name of the station	Fodder Crop/Grass /Variety	Price (Rs/Kg)	Quantity of seed produced			Quantity procured by the States		
			2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
RFS Chennai (kgs)	Cowpea EC4216	100	9900	7703	6330	4050	5750	7500
	Sorghum CO-29	400	1202	1468	1870	0	600	800
	Stylosanthes	350	18.5	1617	1811.5	400	852	1020
	Calopogonium	200	18	67	0	0	0	0
RFS Bangalore (Qtls)	Maize African Tall	50	1730.76	733.5	605.08	1216	1060	1018.5
	Sorghum MP chari	52.50	59.22	1.74	227.9	0	0	0
	PC23	65.00	146.3	144.8		145	24	
	CoFS 29	350		14.44				
	Cowpea EC4216	75	26	29.86	0	0	20.5	6.0
	Rhodes Callide	450	18.21	14.90	19.03	0.20	1.0	1.5
	Guinea Grass	400	10.3	12.05	36.99	0.2	1.0	1.0
	Signal Congo	400	0.91	0	3.36			
RFS Hyderabad	Maize African Tall	50	5895	9608	11012	4575	6917	4273
	Sorghum PC-23	55	8340	5387.5	1377	6200	5000	101
	Sorghum CoFS29	380	0	48	52	0	42	40
	Cowpea APFC-10-1	90	183	14	78			45
	Oats UPO 212	50	142	530	0	85	510	0
	Guinea	400	0	29	384	0	22	140
	Stylo	400	0	14	156	0	10	45
	Rhodes Callide	400	36	6	12	8	0	5
	Cenchrus	400	106	187.5	134	94	177	30
RFS Kalyani	Maize J 1006		31842	36125	8751	28576	2048	8751
	Ricebean		15800	559	3330	2829	2751	583

	Bidhan 1							
	Sorghum PC-23		5403	489	120	1422	4054	1865
	Cowpea BL-1 , 2		5797	3235	2580			
RFS Dhamro d	Sorghum MP Chari	50		4690	5923		2301	
	Sorghum PC-23	50	1650	0	0	0	1050	
	Sorghum CoFS 29	400	840	955	266	0	1715	
	Sorghum PC-9	350		3635	659	1145	1400	965
	Sorghum CSV-21F	50		240	419			
	Bajra HC-20	65	440	535	940	0	156	
RFS Hisar	Chinese cabbage	70	7660	4610	1120	10	3500	800
	Bajra hc20	30	440	1400	6980	915	0	8000
	teosinite	45	340	620	1380	0	0	0
	Sorghum MP Chari	45	0	160	1730	0	0	1000
	Sorghum PC23	45	0	4660	4480	0	0	1450
	PC09	45	0	0	1266	0	0	1045
	Oats HJ8	45	25210	6400	5195	2778	1505	500
	Oats OS6	40	24229	800	7093	7748	0	5000
	Oats Kent	40	5655	2660	21410	2048	125	15000
RFS Suratgar h								
RFS Srinagar	Tall Fesue Demeter	550	130	330	200	6	9	12.5
	Orchard Grass commit	550	8	30	10	0.5	9	1.5
	Orchard Grass-currie	550	7	20	33	0.5	2	1.5
	Orchard Grass-Apunui	550	0	0	0			
	Annual Rye Grass-Grassland Manwa	250	338	350	985	1	206	1.5
	Saifoin-Melrose	550	12	30	16	0.5	2	2
	Crown Vetch-Local	550	38	35	120	1	7	1.5
	Red Clover	1000	3					
	Oat-Subjar	55			250			

8. Initiative by State Governments /UTs

8.1 Andhra Pradesh

Government of Andhra Pradesh has come out Fodder Security Policy for Livestock in May, 2015. The Policy is aiming to achieve double digit growth in GSDP in a mission based approach. Based upon the clear understanding of concerns and challenges in Primary Sector, the Government has devised specific target oriented strategies. The State has identified Livestock Sector as one of the growth engines for socio-economic development of the new state of Andhra Pradesh.

The livestock Sector, which provides bulk of the protein to human nutrition, contribute 7% of GSDP and 26% of Agricultural Domestic Product .The Livestock, which provides bulk of the protein to human nutrition, contributes 26% of Agricultural Domestic Product. The Livestock has a good growth potential. However, further growth of the sector is as much dependent upon the availability of fodder and on breed improvement. One of the major challenges is huge shortage of fodder, more so during drought situations and summer. There is 41% shortage in Green Fodder, 42% shortage in Feed concentrates and 20% shortage in Dry Fodder in the State.

The State has formulated a comprehensive fodder policy to increase production and faster growth with objective of fodder security to realize a developed fodder industry that contributes significantly to improve animal production and reproduction. The State has provided fiscal incentives covering 21 activities as follows.

- i. Promotion of Certified Fodder Seed production & fodder development.
- ii. Perennial fodder production
- iii. Promotion of Silage as green fodder
- iv. Production of Fodder Blocks with Fortified Maize Stovers
- v. Bailing of machine harvested paddy straw
- vi. Azolla production
- vii. Farm Mechanization
- viii. Fodder Banks
- ix. Inter cropping of Fodder Crops in horticulture groves
- x. Integrated Water Shed Management Programme (IWMP)
- xi. Tank Bed cultivation
- xii. Rejuvenation of CPRs involving NGOs/ private players/Sheep Societies
- xiii. Promotion of fodder Cultivation in Forest Fringe Areas
- xiv. Plantation of Fodder yielding plants
- xv. Promotion of hydroponic fodder as commercial activity
- xvi. Vacant land utilization
- xvii. Fodder development in vacant Government land
- xviii. Credit support to the entrepreneurs

- xix. Special package for Natural Calamity
- xx. CSR activity
- xxi. Ration Balancing Programme

8.2 Karnataka- Kolar District

Kolar district is faces recurring drought, compounded by water scarcity that adversely affect livestock and agriculture dependent rural livelihoods. District Administration has under taken drought management through green fodder project for ensuring Fodder Security in drought prone Kolar district by promoting self-reliance of Milk produces Co-operative Societies (MPCSs) that are capable of addressing concerns and provide good quality fodder for livestock, enhancing the quality of milk production and augmenting farmer incomes.

Dairy farming in Kolar is dominated by small, marginal farmers and agricultural labours especially by women of the village community, to supplement their livelihood. Kolar dairy farming has experienced a major breakthrough in the last two decades. Farmers now are no more considering dairying as a subsidiary occupation. Now it has been recognized that cattle provides milk, dung, milch and draught animals wealth. Dairying is recorded as an instrument for reducing inter-class disparities in the rural areas. Land and cattle have traditionally been the two basic income yielding assets of Kolar farmers.

An innovative strategy was devised by the district administration, by actively involving MPCSs and farmers having land holding with active bore wells, engaged with Milk produces Co-operative Societies (MPCSs) to address issue of fodder scarcity in the district. Designed and promoted by the District Administration and Department of Animals Husbandry and veterinary Services, it involved boosting self-reliance and encouraging farmers to undertake fodder cultivation through a buy back arrangement with the farmers. As part of the initiative, fodder kits containing African Tall maize(ATM) variety, multi-cut variety of Jowar (Sorghum) were distributed free of cost. Besides, Rs 3200/ acre incentives were provided irrigated land owner to grow forage. The livestock farmers are purchasing green fodder @ Rs. 3-4/kg from fodder cultivators. The fodder cultivation was undertaken in the jurisdiction of all the 754 MPCSs, of the district, so that good quality, economical fodder is available locally. So far, about 32,000 acres had been brought under fodder cultivation. The income of farmers growing fodder is about Rs.40,000/- per acre/ per cropping season.

Paradigm shift in the approach:

- i. Shift from sustenance/survival to growth/thriving mode, despite challenges.
- ii. Green fodder made available locally in plenty, which led to not just healthy cattle, but 7% increase in milk production in the district, which was unprecedented (given that in summer, milk production decreases by 15% otherwise).
- iii. Green fodder was promoted and accepted by farmers as an alternative Cash Crop.
- iv. Milk produced was of good quality (8.5% SNF, 3.5% Fat) which ensured that farmers got their incentive amount.
- v. Sustainable and least cost model for ensuring fodder security which in turn, not only ensure livelihood security, but also enhance farmers income

9. Constraints of fodder and feed.

9.1. Production on Green Fodder

9.1.1 Total area under fodder cultivation is about 9 million ha on individual crop basis. Out of the total an area of 2 million ha under **Berseem** cultivation during Rabi and 2.6 million ha **Sorghum** amongst Kharif as well as Summer / lean period. Seeds are one of the important inputs affecting 20-25% of fodder production. So, DADF will focus on production of high quality fodder seeds in collaboration with SAUs, State Agriculture Farms, State Animal Husbandry Farms etc.

9.1.2 Berseem (Egyptian clover) mostly cultivated Rabi fodder crops in the state of Punjab, Haryana, Uttar Pradesh, Maharashtra and 200 sq mt. is sufficient for small and marginal livestock owner. Market value of seed is around Rs.300-400 per kg. Seed requirement per ha is around 20- 25 kg only. The regional fodder stations of DAHD&F are also not producing berseem seeds. However, the seed of Berseem is imported from Egypt since long ago. This seed is not under production chain of DAC&FW. The Export Import (EXIM) Committee of Seed Division of DAC&FW permit the import of berseem seeds variety i.e. **Mescavi**. The imports are as under:

S.N.	Year	Import (MT)
1.	2004-05	2062
2.	2005-06	2930
3.	2006-07	7912
4.	2007-08	7622
5.	2014-15	13204
6.	2016-17	10474

Source: Advisory Committee on Animal Husbandry & Dairying, 2010 Planning Commission & DAC & FW.

The imports are being carried out by private companies mostly from **Egypt**. Some quantities are also imported from Spain and Italy. This clearly indicates non availability and so an opportunity to produce / of berseem seeds to recover the shortage. This would require coverage of about 2 million ha land dedicated to berseem seed cultivation.

9.1.3 The Sorghum and African Tall Maize- crops is used for grain and fodder both. Presently there is has no problem of seed availability especially during Kharif season. However, the normal kharif sorghum seed when sown during summer crops under Rabi fallow lands excrete HCN (Hydrocyanic acid), which is a poisonous acid dangerous for animals. During summer season fodder seed of sorghum i.e. MP Chari variety & African tall Maize can sown rabi harvested area a **catch fodder crop** in assured irrigated areas to ensure green fodder for productive animals. But, there are problems of non-availability of **MP Chari** variety of sorghum & African tall maize seeds for cultivation during summer season. There are no rolling fodder seed production plan under seed production, procurement and distribution to farmers for fodder cultivation.

9.1.4 Timely availability of quality forage seeds is one of the important limiting factors. The seed chain from breeder to certified seeds does not exist at National (NSC) and SSC level and also the institutional mechanism in most of the states. Our approach should be ensured timely seed availability for 9 m ha. Besides, for increasing 5 m ha additional gross fodder area under catch fodder crop (April to June) in rice – wheat crops rotation area where assured irrigation is exist and also Rice fallow land in Eastern India.

9.2 Dry Fodder

9.2.1 The cereals crop residues wheat, coarse cereals and rice straws contribute about 71% of overall feed resources used for animal feeding, green fodder 23% and concentrated feeds accounts 6% only. Poorer livestock owners, dependent mainly on common and agricultural residue, end up underfeeding the animals. The 34th report of Parliamentary Standing Committee on Agriculture has indicated shortage of 122 million ton dry fodder by 2020. The Group of Secretary (GOS) on Department of Animal Husbandry, Dairying and Fisheries has reported **35 percent shortage of dry fodder**. In such scenario the Dry fodder such as wheat, rice, coarse cereals straw/

stubble would be collected, stored, enriched and transported at deficit areas /region for consistent supply for animal feeding.

9.2.2 The production of cereals is estimated at 251 million tonnes comprises of wheat- 97.44 million tonnes, paddy – 109.15 and coarse cereals -44.39 million tonnes during 2016-17. The ratio of grain and stalk/ stubble production is 1:1.5 & worked out about 370 million tones. An estimate of Ministry of New & Renewable Energy has indicated that the generation crops residues 501 million tones, surplus 140 million tones and burned 92.81 tonnes. State-wise crop residue generated, residue surplus and burned is indicated in Annexure 1 & 2.

9.2.3 The small marginal farmers own only 44% of the agricultural land while they own over 80% livestock asset. The small & marginal farmers by and large collect and managed harvested crops residues for livestock feeding. But large size cultivators due to shortage of agricultural labourers and use of mechanized harvesting **dispose off straw, stubble & stalks in field and burn or re-plough, ultimately lead to shortage of dry fodder in the rural side.**

9.2.4 Department of Agriculture, Cooperation and Farmer Welfare's programme viz National Food Security Mission (NFSM), National Mission on Oil Seed (NMOP), National Mission on Sustainable Agriculture (NMSA), and Mission for Integrated development of Horticulture (MIDH) encompass of interventions/activities, defined from field preparation to the stage of crop maturity with inputs and also being supported by Minimum Support Price (MSP) for foodgrains. The Pradhan Mantri Fasal Bima Yojana (PMFBY) is covered only foodgrain production from seed sowing to crops harvests & threshing. Beside, reliefs are also extended to farmers under NDRF/SDRF by using criteria on productivity of foodgrains. **These interventions have a missing link in respect of crop residues/ straw collection & management at harvesting stage, while the crop residue is an impartment input for Animal Husbandry productivity & production.**

9.2.5 At present the price of dry fodder/ straw of livestock are several times more than the existing prices of foodgrains under Food Security Act. In lean period & cyclone / droughts, floods etc situations there are acute shortage of straws/ dry fodder and normally available @ **Rs. 6 to 12 per kg (Rs. 600-1200/qt)**. Besides, small scale

dairy owners are being forced to buy the commodity at a very high, hitting their businesses and margins. **In normal course about 70% expenditure incurred by the farmers on dry fodder including green forage & feed.**

9.2.6 Both, human and animal population depends on cereals, pulses, oil seeds and horticulture crops. Animal population, in return have adding nutritional security to human being in the form of milk & its product i.e. paneer, butter oil and meat etc. **The prevailing situation call for crops residues collection, storage & management to ensure dry fodder security for livestock reares in normal as well in deficit areas by undertaking two week intervention at harvesting time of wheat, paddy & coarse cereals.**

9.3 Feed

9.3.1 The manufacturing of compounded cattle feed is by and large with the private sector agencies (both organized and unorganized) and dairy federations. The usage of compounded cattle feed has not witnessed the desired level of growth over the years. The shift of focus towards rearing animals with higher production potentials and the mushrooming of commercial dairy farms is likely to enhance production and consumption of nutritionally balanced compounded feed.

9.3.2 Among the concentrate feed ingredients, coarse grains viz., maize, sorghum, bajra and other millets occupy the primary position. Cereal byproducts such as barns and polish and various oil meals including ground nut cake, mustard cake, coconut cake, soyabean meal, cotton seed meal and sesame cake form bulk of the concentrate requirements. Maize substituted by sorghum and pearl millet for poultry is not preferred for lack of yellowness of yolk in eggs, provided by only maize. Various agro-byproducts and unconventional products such as molasses, distillery waste, wastes and byproducts from bread/biscuit industries, breweries, hotels, tamarind seed powder, mango seed kernel, Sal seed meal, etc. are also used as cattle feed or used in manufacture of cattle feed concentrates.

9.3.3 Parliamentary Standing Committee has estimated that there is shortage of **35 million** tone of concentrates. The Group of Secretary (GOS) on Department of Animal Husbandry, Dairying and Fisheries has **reported 45 percent shortages of concentrates.** The Feed industries generally use Maize, Soybean, wheat/rice bran etc.

It call for focus on procurement of inferior quality of foodgrains, or non-existent of MSP procurement areas in Eastern States by incentivise “**Price Deficiency Payment**” to the farmers cultivating Maize, Soybean etc for providing raw material of feed industries to meet the requirement of concentrate for bovine, poultry, pigs and inland fisheries. NITI AAYOG has designed that each farmer would register her crop and acreage sown with the nearest APMC mandi. If the market price then falls below the floor price, the farmer would be entitled to the difference up to a maximum of say, 10% of the MSP-linked price that could be paid via Direct Benefit Transfer (DBT) into an Aadhaar-linked bank account. The facilitation of procurement to be provided to those who have setup feed industries in procured areas.

9.3.4 The Standard of cattle feed formulation are defined by the Bureau of Indian Standard (BIS), a statutory body created by Government of India. The standards are updated in consultation with CLFMA and mandatory for all producers to adhere to these standards. However, formulation of and cost of cattle feed largely depends on the on the availability of ingredients in the neighborhood and their prevailing prices.

10. Proposed Policy and Interventions for Fodder and Feed Security

In light of the above analysis, Fodder & Feed Security Programme -2022 is proposed to be launched starting 2017-18 to address fodder problems in the form of a focused programme considering all the stakeholder/Institutions. The Fodder & Feed Security Programme-2022 (FFSP-2022) will focus on increasing production area, increasing productivity and availability through adoption of improved and appropriate technologies and intervention best suited to specific agro-climatic region in both arable and non-arable land.

10.1 Objectives: The Fodder and Feed Security Programme 2022 (FFSP- 2022) is aimed to achieve following seven key objectives:

10.1.1 Increasing production of Green Fodder through area expansion and productivity enhancement by scientific fodder cultivation;

10.1.2 Establishing effective high quality variety specific seed production chain as per agro-climatic zoning with the involvement of ICAR institutions, KVKs, farmers producer organization / seed village organisation, dairy cooperatives,

State Agriculture / Horticulture /Veterinary Universities, State Agriculture Farms , Seed Corporation / federation and entrepreneurs;

10.1.3 Collection and post harvest management of crops residues to fulfill the requirement of dry fodder;

10.1.4 Commercialization of Fodder & Feed including fodder mechanization services for silage, baling, block making, fodder banks/ depos, etc. at Village / Block / District level for rural job creation & employment ;

10.1.5 Technology & Innovation interventions like Hydroponics, Azolla, Crops (Silviculture, Horticulture), high protein fodder such as Moringa Oleifera , etc and

10.1.6 Enhancing farm level economy by feed cost reduction to restore confidence amongst the dairy farmers.

10.2 Targets

10.2.1 Additional Production of Green Fodder of 250 million tonnes by bringing 10 million ha gross fodder cropped areas;(thereby doubling fodder in gross cultivated area);

10.2.2 Bringing 2 million ha area under perennial grasses;

10.2.3 Bringing 5 million ha as catch crops & intercropping of fodder crops in horticultural/ Plantation areas;

10.2.4 Collection & post harvest management of additional 150 million tonnes of dry fodder;

10.2.5 Fortification & enrichment of 150 million tonnes of dry fodder; and

10.2.6 Enhance additional availability of 35 million tonnes of concentrates;

10.3 Strategies

To achieve the above objectives and targets, the FFSP- 2022 would adopt following eleven strategies:

10.3.1 Focus on assured irrigated, residual moisture areas especially in high potential productive bovine districts/milk routes enabling through assured supply of quality , certified, truthfully labeled fodder seed;

10.3.2 Incentivize irrigation for fodder as a catch crop between wheat – rice cropping system, rice fallow and intercrop in orchard areas.

10.3.3 Focus on rainfed areas for cultivation of perennial grasses, fodder trees and shrubs.

- 10.3.4 Facilitate land leasing and contract farming on cluster basis to commercialise fodder cultivation, silage making and enrichment of dry fodder & storage through Fodder Corporation , FPO, etc.
- 10.3.5 Rehabilitation of degraded land and forest fringe areas with perennial fodder grasses including moringa oleifera (sahajan), hedge lucerne, etc for small ruminants.
- 10.3.6 Agro climatic zone wise planning & incentivize for collection of paddy,wheat and coarse cereals stubble for dry fodder and its transportation to deficits destination.
- 10.3.7 Focus on procurement of inferior quality of foodgrain or non-existent of MSP procurement areas in eastern States by incentivizing through “Fodder & Feed Cultivation Innovation (FFCI)” to the farmers for providing raw material of feed industries to meet the requirement of concentrate for bovine, poultry and inland fisheries.
- 10.3.8 Setting up of Fodder depots on Public-Private-Partnership (PPP) basis for making availability of dry fodder, forages & concentrates in high density milch animals’ localities especially for SC / ST, marginal & small and landless dairy farmers engaged in livestock rearing.
- 10.3.9 Encouraging silage making at block & large panchayat level by dovetailing with PPP, FPOs , milk co-operatives & SHG groups, especially of women. Integration of various proposed interventions and targets with district plan of each identified district
- 10.3.10 Setting up block & large Gram panchayat level fodder block/silage block/baling & other related fodder mechanization service at village /Block/Panchayat level in PPP/Coop/ FPO/SHG basis.
- 10.3.11 Strategic funding assistance to ensure timely reach of interventions to the targeted beneficiaries. Also constant monitoring and concurrent evaluation by the implementing agencies for assessing the impact of the interventions for a result oriented approach.

11. Coverage of Fodder and Feed Security Programme

The Fodder and Feed Security Programme will be implemented in all States and Union territories to promote holistic growth in fodder resource availability covering fodder production, conservation and marketing; fodder seed production and marketing; grassland development including horti-pasture and silvi-pasture development; intensive fodder management on individually and community owned lands; and, post harvest management of green fodder & crop residues and their utilization for round the year feeding of livestock for increased productivity.

11.1 Production of Green Fodder.

Total area under fodder cultivation is about 9 million ha on individual crop basis. Out of which an area of 2 million ha under **berseem** cultivation during Rabi and 2.6 million ha **sorghum** amongst Kharif as well as summer / lean period crops. Seeds are one of the important inputs affecting 20-25% of fodder production. So, DADF will focus on production of high quality fodder seeds in collaboration with SAUs, State Agriculture Farms and State Animal Husbandry Farms etc.

11.1.1 Assistance for Fodder seeds production: Fodder seeds need to be provided among dairy farmers at subsidies rate for its cultivation. The seed production & availability programme should be modified as per ongoing National Food Security Mission under which NSC, NAFED, IFFDC, KRIBHCO and HIL has been assigned to ensure the supply & availability of certified / quality seed. Wherein, assistance for production of certified seed is being provided to seed growing agencies. About 75% of the subsidy is meant for farmers and 25% for seed producing agencies to meet expenditure including certification cost. The Seed Producing Agencies shall be eligible for the incentive only when they purchase the seed production from the farmers and issue a certificate to this effect. The subsidy will be given to central seed agencies like NSC, KRIBHCO, IFFCO etc directly and to State Seed Corporations and Private Seeds companies through State governments. The central seed agencies will submit action plan for approval of DADF.

11.1.2 Assistance to Fodder Seed distribution in the form of Minikits: Seed producing agencies (NSC/SSCs/SAUs/ /Private Companies) authorized by the State will distribute seed to selected districts. The District Milk Federation, Milk Produces Cooperative Societies / District Fodder Security Executive Committee will finalize the list of beneficiaries in consultation with Village Milk Federation / Panchayat. Assistance for purchase of seeds will be available to selected Dairy farmers for the area not exceeding 2 ha each.

In case of supply of seeds by Central Seed Agencies like NSC reimbursement of subsidy for distribution will be made directly by the DADF to such agency, within 20% of State's Seed distribution target in identified Fodder Security Mission districts on the basis of verification by Districts/States and adjusted from the State's overall allocation under seed distribution component. Sapling of grasses may also be assigned and assistance to be provided on its transplantation potential grass cultivation field.

11.1.3 Fodder production from Forest and Non-forest wasteland / Gauchar/ rangeland / grassland /non-arable land/Rivers basin, watershed catchments area/canal embankments. Activities are proposed under this component are: distribution of seed / planting material of improved varieties of suitable crops and grasses, ancillary planting, horti-pastoral/ silvi-pastoral plantations tending, protection and maintenance works up to 5th year of planting / sowing, Rangeland improvement and Harvesting and densification of fodder.

11.1.4 Fodder Demonstrations for Livestock based farming system approach.

The livestock rearers is to be focused on cluster basis where in improved cultivation practices of fodder, legumes & grasses production for high value farm livestock rearing including small ruminants will be targeted and encouraged to ensure round the year green fodder availability with buy back arrangements. Thereby green fodder made available locally in plenty which lead to not just healthy cattle but also increase their productivity even during drought situation. A system of diversified farming will be encouraged where diversification to fodder crops and livestock rearing could be accepted by farmers as an alternative cash crop. It involved encouraging farmers to undertake fodder cultivation through a buy back arrangement with the dairy farmers, thereby land owners, as well as small & marginal, landless livestock rearers could be permanently earn and increase their income.

A cafeteria of fodder crops, grasses, shrubs /trees, intercropping specific intervention (seeds, sapling, nutrients, irrigation etc) would be provided to enable the States to pick up the critical inputs relevant to that particular Agro- Climatic Zone for dissemination through large scale demonstration. It is expected that these demonstrations on large scale will have a positive impact to change the mindset of the farmers to diversify for high value product under Animal Husbandry sector. These demonstrations also visualizes commercialization of fodder will create rural job & employment and enhance farm level economy to restore confidence amongst the Dairy farmers.

11.1.5 Strengthening & Development of Infrastructure-The National Accounts Statistics 2017 indicates that between 2011-12 and 2015-16, the total value of the cereals and pulses produced in the country went down by 3%, for Oilseeds by over 13% and Sugar by 1% but value of grass which is mainly used as cheap forage for milch animals **increased by 1%**. In this scenario the department will focus on the State / Milk Federation/ State Agricultural/ Horticultural / Forestry / Veterinary Universities Farms for fodder seeds & fodder production, as well as capacity building through training & demonstrations. There are more than two hundred farms with an estimated area of 5000-6000 ha in the States/UTs which may be focused upon for improved fodder, fodder grasses, seeds production for increasing livestock productivity in their domain. These investments likely to bound increase value of output of grasses in agriculture and allied sector.

11.2 Dry Fodder management through post harvest operations & technologies

The Dry fodder such as wheat, rice, coarse cereals straw/ stubble would be collected, stored, enriched and transported at deficit areas /region for consistent supply for animal feeding. The proposed interventions / components for Dry fodder are as under.

11.2.1 Assistance to crops residue producers. It is proposed to collect straw/ stubbles covering 10 million ha by 2019-20. A incentive of amounting Rs.1000/ ha is proposed to be extended to those farmers who have left crops residue for permitting its collection by Marginal & Small, SC/ST, Women and Landless Dairy farmers.

11.2.2 Feed and Fodder Farmers-Entrepreneurship Development (FFFED)

(i) **Assistance to crop residues collection, storage, transportation:** The collection of crop residue works be encouraged for marginal & small, SC/ST, women and landless Dairy farmers with active facilitation of line department /agencies. For this purpose an amount of Rs. 1000/ ton incentive to be provided for straw collection limited to 1000 ha for one group of straw collector may be dovetailed from MNREGA funds. Small & marginal & landless may form Self Help Groups (SHGs), Farmers Interest Groups (FIGs), End Implementing Agencies (EDIs) with facilitation of Primary Milk Produces Cooperative/ Federation . The members may access collected straw as per their livestock needs. The surpluses may be stored for further commercial marketing. This group may also be supported with baling machines & feed Block Making units and further enrichment for commercialization to deficit locations.

(ii) **Straw / dry fodder collector / Straw business entrepreneur covering 1000 ha** may be able to collect straw of Rs. 1.8 crore per cropping season (straw production @ 30 qt /ha x Rs.600/qt = Rs.18, 000/ha). The proposed incentive may be extended only for one times and further the dairy farmers / straw entrepreneurs evolved self- reliance on straw by struck a deal to buy stubble per ha with cultivators for the next cropping season . **The proposed intervention is economically viable in assured irrigated-wheat – paddy crop rotation area and dovetailing with MNREGA programme will help meet funding needs at village level directly to the farmers/ farmers cooperatives through DBT/ Bhim App mechanism.**

(iii) Feed and Fodder Making Entrepreneurship Assistance:

For this a Fodder Entrepreneurship Development Scheme (FEDS) will be launched. FEDS will give incentive at the rate of 25% and 35% to General /SC-ST beneficiaries/ Fodder Entrepreneurs /SHGs, FPOs, Cooperatives, for providing Fodder & Feed.

(a) Distribution of Hand and Power Driven chaff cutters

Financial support for post harvest operations, like providing chaff cutters (hand/power driven) to the Farmers- Entrepreneurs for establishment of fodder densification units, feed enrichment units, and area-specific mineral mixture units, etc. **at village /Block / District level on a profitably sustainable basis.**

(b) Fodder Machinery for Value Addition. These activities will include Infrastructure development for Fodder block, Silage/ Hay Making/enrichment at individual/ Panchayat / block / Primary Milk Cooperative level and establishment of Fodder banks.

(c) Fodder Depos -The States are opening fodder depots during drought, flood and other natural calamities situations through resources from State Disaster Relief Funds (SDRF) and National Disaster Relief Funds (NDRF). These depots are serving of fodder availability during that situation and lasted 90 days only. However, it is reported that during normal periods, there are shortage of green and dry fodder which impede the productivity and production of livestock. The States facing frequent drought namely Andhra Pradesh, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh etc. Besides, some States namely Assam, Bihar, Eastern Uttar Pradesh, Uttarakhand have been experiences of perennial floods. Besides, the landless agricultural labour, small & marginal farmers families can take to stall-fed animal enterprises provided they are helped through Fodder Depos. In the cold desert area & snowstorm hilly region, fodder is a major constraint for livestock and small ruminants. The establishment of Fodder depots can help to promote higher productivity and production.

In the country, there are 2.49 lakhs village Panchayat and almost all Panchayat farmers are rearing livestock as an income sources. The State like Haryana and Punjab, having surplus fodder, however, remaining States are deficient even in normal situation. Opening of fodder Depos require all weather locally suitable storage, weighing balance / machines, chaffing machines etc and rail/road connectivity for transportation. These depots will be open as per requirement of the States. The depots will be opened by landless, SC/ST, small and marginal farmers including SHG of women's of these groups under the FFEDS.

(d) Establishment / Modernization of Bypass protein making, area specific mineral mixture/feed manufacturing /feed pelleting units. Commercial units shall be supported for production of bypass protein, areas specific mineral mixture to bridge the gap of feed availability and ensure supply to high yielding livestock.

(e) **Establishment / Modernization of Feed Testing Laboratories.** To ensure the supply of quality manufactured feed , the feed testing laboratory to be strengthened and opening of new testing laboratories under State Animal Husbandry , Milk Union/ Federation, Agriculture , Veterinary / Fisheries Universities & Collages is also proposed.

(f) FFEDS Funds - It is proposed to set up FFEDS as part of Sub-Mission on Feed & Fodder Development under NLM at an initial budget allocation of Rs.50 crore for 2017-18 .This will be increased in the subsequent years as per demand .

11.3 Feed Management

11.3.1 Facilitation for Procurement and Supply of raw feed material to Feed Industries:

Parliamentary Standing Committee has estimated that there is shortage of **35 million** tone of concentrates. The Group of Secretary (GOS) on Department of Animal Husbandry, Dairying and Fisheries has **reported 45 percent shortages of concentrates.** The Feed industries generally use Maize, Soybean, wheat/rice bran etc. It call for focus on procurement of inferior quality of foodgrains, or non-existent of MSP procurement areas in Eastern States by incentivizing through **“FFCI”** to the farmers cultivating maize, soyabean etc for providing raw material of feed industries to meet the requirement of concentrate for bovine, poultry, pigs and inlands fisheries. The facilitation of procurement to be provided to those who have setup feed industries in procured areas.

12. Sources of funds

In order to implement fodder and feed security programme including such components as,FFEDS etc ,a sum of Rs.9830 crores is provided for 2017-18 to 2021-22.The details items wise proposed expenditure is indicated at Annexure 3.

13. Expected outcomes:

- i. Bridge the gap between demand and supply of green fodder, dry fodder and feed of livestock.

- ii. Dry Fodder availability for bovine round the year would be ensured by two week interventions at harvesting period of crops ultimately lead to provide balanced rationing to livestock.
- iii. Collection and managing of stubble /straw will also mitigate problems of fogging /smog up to some extent.
- iv. Increase production and productivity of livestock.
- v. Diversification of agriculture to livestock based farming system.
- vi. Creation of employment generation with commercialization of fodder.
- vii. Increase opportunity for setting up of Agro-based feed industries in rural areas.
- viii. Enhance farm level economy and restore confidence amongst the livestock rearers.
- ix. The Action Plan will definitely a step to lead doubling of dairy farmer's income by 2022.

14) Programme Monitoring and review mechanism

The scheme would be implemented by the DADF , through State Government which would make funds available to the District Level Implementing Agency in accordance with approval of programme of the district as per action plan. The overall supervision of the scheme would be done by a NLM Executive Committee constituted under the Chairmanship of Secretary (ADF). The National Livestock Mission Director in the rank of Joint Secretary is the instrumental in conceiving, developing and implementing the FFSP and other related activities.

A Fodder & Feed Security Cell will be set up at National, State and Districts level to co-ordinate and effective implementation of the programme for achieving desired objectives & goal. Provision for engaging Consultants, Young Professional, Data Entry Operator, etc at National, State and District level will be met from 5% funds earmarked for Administrative expenses. The Honorarium for consultants at National, State and District level will be @ Rs.85, 000, Rs.65, 000 and Rs.45, 000 per Month. Similarly, Honorarium to Young Professionals/Technical Assistants, Data Entry Operators at State and District levels @ Rs.30, 000 and Rs 20, 000 per month, respectively along with traveling expenses. The basic office infrastructure, computer, stationery etc are also supported. The consultants/professionals must have agricultural/ horticultural / forestry/ animal nutrition qualifications and experiences

At National level the 2 Consultants and 2 Data Entry Operators may be deployed. Besides, 8 Regional Fodder Stations of DADF also supported with deployment of 2 consultants, 1 DO and 1 MTS. Regional Fodder Stations will also be assigned to task of Monitoring of programme .

States/UT may hire personnel as per their need. The Fodder Security Cell should be interlinked within State's districts and also with other States to meet the requirement during drought, flood & lean period and also in normal situation.

Annexure1

**State-wise major cropped area under rice, wheat and sugarcane-
Crops prone to residue burning**

(Area in thousand ha.)

S.N	Name of States	Area under major cereal crops and sugarcane			Crops prone to residue burning
		Rice	Wheat	Sugarcane	
1.	Andhra Pradesh	3628.0	8.0	196.0	Rice & Sugarcane
2.	Assam	2488.2	33.9	28.9	In jhum areas, plants, & bushes are burnt
3.	Bihar	3298.9	2207.7	250.3	Rice, wheat and sugarcane
4.	Chhattisgarh	3784.8	101.2	13.5	Rice
5.	Gujarat	701.0	1024.0	176.0	Rice and wheat
6.	Haryana	1215.0	2497.0	101.0	Rice, Wheat & sugarcane
7.	Himachal Pradesh	76.9	364.2	1.9	No. crop residue is burnt
8.	Jammu & Kashmir	261.7	290.0	0.0	No. crop residue is burnt
9.	Jharkhand	1414.5	164.3	6.7	No. crop residue is burnt
10.	Karnataka	1278.0	225.0	425.0	Rice and Sugarcane
11.	Kerala	197.3	0.0	1.7	No. crop residue is burnt
12.	Madhya Pradesh	1882.6	5300.0	59.5	Rice and wheat
13.	Maharashtra	1557.0	773.0	933.0	Rice and Sugarcane
14.	Odisha	4022.8	1.0	14.5	No. crop residue is burnt
15.	Punjab	2845.0	3512.0	83.0	Rice, wheat and Sugarcane
16.	Rajasthan	125.6	3063.2	5.5	No. crop residue is burnt
17.	Tamil Nadu	1493.1	0.0	347.2	Rice and Sugarcane
18.	Uttarakhand	262.8	358.1	109.9	Rice and wheat
19.	Uttar Pradesh	5861.0	9734.0	2212.0	Rice, wheat and Sugarcane
20.	West Bengal	5444.3	321.6	16.1	Rice
21.	Others	915.4	25.1	17.2	No. crop residue is burnt
Total		42753.9	30003.3	4998.9	
Total (million ha.)		42.75	30.00	4.99	

Source: Directorate of Economics & Statistics, MOA, DAC, New Delhi (Final estimate-2012-13).

Annexure2

State-wise crop residue generated, residue surplus and burned

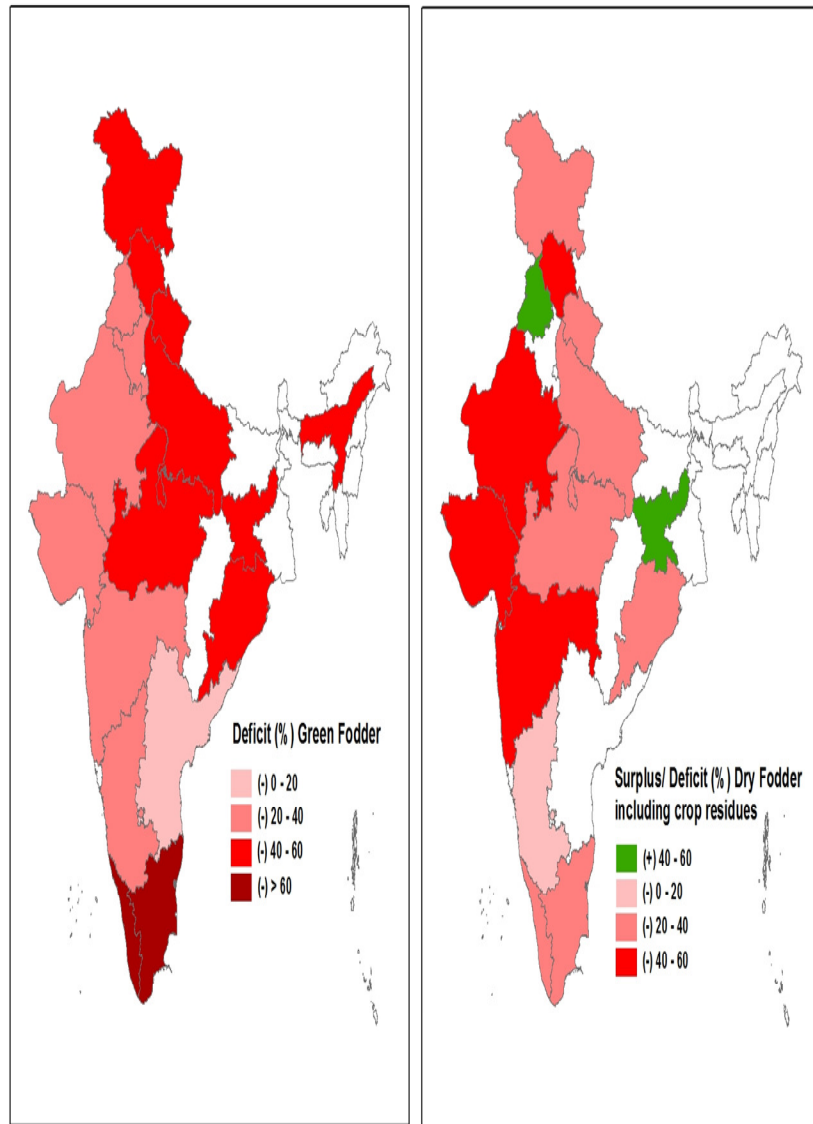
(Crop residue in Million Tonne)

S. No.	States	Residue generation*	Residue surplus*	Residue burned \$
1.	Andhra Pradesh	43.89	6.96	2.73
2.	Arunachal Pradesh	0.40	0.07	0.04
3.	Assam	11.43	2.34	0.73
4.	Bihar	25.29	5.08	3.19
5.	Chhattisgarh	11.25	2.12	0.83
6.	Goa	0.57	0.14	0.04
7.	Gujarat	28.73	8.90	3.81
8.	Haryana	27.83	11.22	9.08
9.	Himachal Pradesh	2.85	1.03	0.41
10.	Jammu & Kashmir	1.59	0.28	0.89
11.	Jharkhand	3.61	0.89	1.10
12.	Karnataka	33.94	8.98	5.66
13.	Kerala	9.74	5.07	0.22
14.	Madhya Pradesh	33.18	10.22	1.91
15.	Maharashtra	46.45	14.67	7.42
16.	Manipur	0.90	0.11	0.07
17.	Meghalaya	0.51	0.09	0.05
18.	Mizoram	0.06	0.01	0.01
19.	Nagaland	0.49	0.09	0.08
20.	Orissa	20.07	3.68	1.34
21.	Punjab	50.75	24.83	19.65
22.	Rajasthan	29.32	8.52	1.78
23.	Sikkim	0.15	0.02	0.01
24.	Tamil Nadu	19.93	7.05	4.08
25.	Tripura	0.04	0.02	0.02
26.	Uttarakhand	2.86	0.63	0.78
27.	Uttar Pradesh	59.97	13.53	21.92
28.	West Bengal	35.93	4.29	4.96
	Total	501.73	140.84	92.81

Source: * Ministry of New & Renewable Energy (MNRE, 2009), Govt. of India, New Delhi

\$ Pathak Himanshu et al (2010), Senior Scientist, C.E.S. & C.R., IARI, New Delhi

Fodder Scenario in India



Fodder and Feed Security Programme
Component wise Physical Targets and Financial Outlay

(Rs in crore)

S. N	Components /items	Unit Cost (Rs.)	2017-18		2018-19		2019-20		2020-21		2021-22		Total		
			Physical	Financial	Physical	Financial	Physical	Financial	Physical Targets	Financial out lay	Physical Targets	Financial out lay	Physical Targets	Financial out lay	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
A	Green Fodder														
1	Assistance on certified /quality fodder seed production to central seed agencies (NSC ,NAFED, KRIBCO ,IFFCO/IFFD C, HIL & SSC & Private Company (75%subsidy will go to farmers and 25% to seed agencies with condition that the amount will be reimbursed to the seed agencies only	a)Coarse fodder seeds @ Rs. 25/kg or 50% of the cost whichever is less 5 Mha African Tal Maize, Jowar, Bajra	10000	25	20000	50	20000	50	25000	62.5	25000	62.5	100000 ton	250	
		b) Leguminous Fodder Crops & Grasse	5,000 Ton	50	10,000 Ton	100	10000 Ton	100	10000	100	15000	150	50,000 Ton	500	

	when they purchase the seeds from farmers and issue a certificate to this effect).	s seeds @ (Rs100 /kg) or 50% of the cost whichever is less 2 Mha Berseem 1 Mha Lucerne 2 Mha Grasses												
2	Fodder seed distribution in the form of Minikits	i.) Coarse fodder seeds (subsidized @ Rs. .20/kg) or 50% of the cost whichever is less	7.5 million kits	60	10million kits	80	15 million kits	120	15	120	15	120	2,50,000 Ton (62.5million kits) (kit size 4kg)	500
		ii) Leguminous crops & Grasses seeds (subsid	10million kits	200	10million kits	200	10million kits	200	10million kits	200	10million kits	200	100000 Ton (50million kits) (kit size 2kg)	1000

		ized @Rs.1 00/kg) or 50% of the cost whiche ver is less												
3	Forage production from Wasteland/ Gauchar /Rangeland/ grassland/ /non-arable land /Rivers basin, drainage line , degraded mining land, watershed catchments area / canal embankments /Forest (ha)	1 lakh	20,000	200	20,000	200	20,000	200	20000	200	20000	200	1,00,00 0	1000
4	Fodder Demonstrations for Livestock based farming system approach.(ha)	Rs. 20,000 per ha	10,000	20	10,000	20	10,000	20	10000	20	10000	20	50,000 ha	100

5	Strengthening & Development of Infrastructure of State / Milk Federation/ SAUs/Veterinary University Farms for fodder seeds & fodder production, training & demonstration	Rs. 5 crore / Farm (as per need)	40	200	40	200	40	200	40	200	40	200	200	1000
B Dry Fodder management through post harvest operation & technologies														
7	Assistance to crops residue producers (ha)	Rs. 1000/ ha	2 M ha	200	2 M ha	200	2 M ha	200	2 M ha	200	2 M ha	200	10 M ha	1000
8	Assistance to crop residues collection, storage, transportation (Tons)*	Straws of Coarse cereals, wheat and paddy @ Rs. 1000 per Ton	4M tonne	400	4 M Tonne	400	4 M Tonne	400	4M tonne	400	4M tonne	400	20M Tonne	2000
9	Distribution of hand driven chaff cutters (No.)	10,000/ unit	20000	20	20000	20	20000	20	20000	20	20000	20	100000	100
10	Distribution of power/diesel/ solar driven chaff cutters	30,000/ unit	20000	60	20000	60	20000	60	20000	60	20000	60	100000	300

	(No.)													
11	Establishment of high capacity Fodder Block Making & enrichment units (No.)	Rs. 1.5 crore /unit	20 nos	30	20 nos	30	20 nos	30	20 nos	30	20 nos	30	100 nos	150
12	Distribution of a) tractor mountable Fodder Block Making units/ b) Hay Bailing Machine / c) Straw Reaper d) Forage Harvester Reaper (No.)	Rs.20 Lakh/unit	200	40	200	40	200	40	200	40	200	40	1000 nos	200
13	Establishment of Silage making units (No.)	Rs. 20 Lakhs/unit	200 nos	40	200 nos	40	200 nos	40	200 nos	40	200 nos	40	1000 nos	200
14	Setting up of fodder	5lakhs/depos	5000	200	5000	200	5000	200	5000	200	5000	200	20000	1000

	banks/depos													
C	Feed management													
15	Facilitation for Procurement and Supply of raw feed material to Feed Industries**	Rs. 200/ton	2	40	2	40	2	40	2	40	2	40	10 Million Tons	200
16	Establishment of Bypass protein/ fat making units (No.)	Rs. 2.00 Crore /unit	10	20	10	20	10	20	10	20	10	20	50	100
17	Establishment of area specific mineral mixture/feed processing units/feed pelleting units (No.)	Rs. 2.00 Crore /unit	10	20	10	20	10	20	10	20	10	20	50	100
18	Establishment / modernisation of Feed testing laboratories (No.)	Rs. 2.00 Crore /unit	10	20	10	20	10	20	10	20	10	20	50	100
D	Implementation & Monitoring													
19	Setting up of Fodder Security Cell #	a) National 100%		2		2		2		2		2		10

		b) State & Districts level		4		4		4		4		4		20
20	Grand Total			1851		1946		1986		1998.5		2048.5		9830.00
21	Total GOI Outlay on existing sharing pattern (60:40)			1109.4		1166.4		1190.4		1197.9		1227.9		5892.00

- * To be assigned for collections of crop residues through Marginal & Small, SC/ST, Women and Landless Dairy farmers. Limited to 1000 ha for one group of straw collector.
- ** Facilitate procurement of inferior quality of food grains or MSP non-existent operational areas from farmers by providing “*price deficiency payment*” for supplying raw material to meet the requirement of concentrate for bovine, poultry and inland fisheries.
- # State Fodder Security Cell will be interlinked with other States/UTs to meet the requirements of fodder & feed in deficit areas during prevailing situation of drought, flood and lean period. At District, State and National level, Consultants, young professionals, data entry operator will be engaged as per the norms of other programme on Ministry of Ag & FW.
