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Status and profitability of fodder crops in Madhya Pradesh

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Abstract

The study comprises the information collected through secondary data (1990-2009) of all the districts of Madhya Pradesh and primary data collected from 150 fodder growers by personal interview from three maximum fodder producing districts (Rajgarh, Shajapur and Ujjain). It is observed from the study that the fodder cultivation was not shown too much progress in the state since 1990. The cultivators still growing fodder in the line of crop cultivation and the majority of them were not known the recommendation package of practices of fodder cultivation. The fodder growers were also found not doing fodder preservation technique viz. hay and silage making for the lean period. They were not cultivating fodder in the commercial line as none of them involved in marketing of fodder in the state. Hence, it is the right time that state government re-intensified their efforts in progress of fodder in the state because without introducing dairy based farming system approach on the farmers' farm, their income should not become double, which is the ultimate target of the state government. It is only activity which not only generated income but also enhanced employment at their owned farm.

Keywords: Profitability, Fodder

Madhya Pradesh is basically an agricultural state where about 70 per cent of its peoples live in villages. Their livelihood is dependent mainly on agriculture and animal husbandry. Though, state has a huge livestock population of over 4162.96 millions, besides poultry, yet the production of milk and other livestock products is the lowest in India. The state, highly deficient in various cattle products, though state has about one-fourth of the total cattle population of India. As against the minimum nutritional requirement of 201 g/head/day of milk set by the nutritionists, 100 g/head/day is the availability per head in the state. One of the main reasons for the low productivity of livestock is malnutrition and the low genetic potential of the animals. In fact, the economic viability of livestock husbandry depends on sources of feed and fodder as feeding cost constitutes about 65 - 70% of the total cost of livestock farming. The feed given to cattle comprises dry fodder, green fodder and concentrates of which dry fodder forms the major share. The adequate supply of feed and fodder is a critical factor affecting performance of animals. This fact is adequately supported by the figures of availability, vis-a-vis the requirement of green-fodder crops, crop residues and concentrates, which shows that there is a huge gap of between demand and supply of all kinds of these feeds and fodders in the state.

Fodder crops may be classified as temporary or as permanent crops; the former are cultivated and harvested like any other crop, the latter relate to land used permanently (five years or more) for herbaceous forage crops, either cultivated or growing wild (wild prairie or grazing land). They may include some areas of forest lands that are used for grazing. The fodder can be fed to animals through processing as green feed; as hay, i.e. crops harvested dry or left to dry if harvested green; or as silage products (Kindu Mekonnen et al. 2009) Though, Silage or ensilage is a method of preservation of green fodder through fermentation to retard spoiling and this method of processing is more popular in India as compared to hay making but in Madhya Pradesh the hay and silage making methods of preservation of fodder are not been found in practices by the cultivators.

On the other hand, if we examine the land resources available for growing fodder and forage crops, it is estimated that the average cultivated area devoted to fodder production is only 4.4 per cent of the total area in India, and it was found to be only 3 per cent in Madhya Pradesh similarly, the area under permanent

pastures and cultivable wastelands is approximately 13 and 15 million hectares respectively but it was found to be only 4.42 and 3.37 per cent of net area sown (150.74 lac ha) in the state likewise, the total area under forests is 2.51 crore hectares and that open to grazing is 2.1 crore hectares. All these resources are able to meet the forage requirements of the grazing animals only during the monsoon season. But for the remaining periods of the year, the animals have to be maintained on the crop residues or straws of sorghum, pearl millet, ragi, wheat, barley, etc. either in the form of whole straw or a bhusa, supplemented with some green fodder, or as sole feed. The crop residues are available mainly from wheat, paddy, pearl millet, sorghum, soybean, sugarcane trash, etc., which are poor in nutritive value. Cultivation of high yielding or hybrid varieties of wheat and paddy to enhance grain production has changed the grain-foliage ratio more favorable to humans, thus affecting the production and availability of straw. Besides this, the decrease in paddy cultivation due to drought and water shortage has also affected the availability of straw. The green fodder resources for livestock are mainly derived from grazing in grasslands and pastures, fodder crops from cropped lands, weeds, bund grasses, tree leaves and mixed forages. The sustainability of dairy industry in India largely depends upon the quality of herbage based animal feed and fodder. Green fodder is the essential component of feeding high yielding milch animals to obtain desired level of milk production. Lack of quality fodder, especially during winter, is a major limiting factor in improving livestock production. (Dost Muhammad 2001) The technology of growing year round fodder production has helped the farmers/dairy owners to sustain their milch animals of 6-7 liters per day potential with minimum use of concentrates, thus producing milk at cheaper cost.

The cost production of milk increased day by day and in the production cost of milk, the cost of green fodder is found highest. If the cost of production of green fodder decreases it also decreases the cost of milk production Hence, looking to the above points in consideration present study is formulated to examine the status, the costs and returns of various fodder crops and problem faced by the growers in production of fodder in Madhya Pradesh.

Research Methodology

Amongst different districts (50), 3 districts i.e. Rajgarh, Shajapur, and Ujjain have been selected purposively for the study on the basis of the highest area in fodder cultivation in Madhya Pradesh (569987 ha). Amongst the selected districts, two blocks from each district, one block near and one distant to the periphery of district headquarter has been selected randomly to realize the effect of distance factor in the findings. A cluster of 3 villages has been randomly chosen from each block. Finally, a sample of 25 farmers was selected randomly from each selected cluster, spreading over various farm size categories i.e., marginal (less than one hectare), small (1-2 hectares), semi-medium (2-4 hectares), medium (4-10 hectares) and large (more than 10 hectares) based on the size of the operational holding, making a total sample of 150 farmers. The primary data collections were done by the personal interview method for the reference year 2009-10.

The required secondary data were also collected on the different aspects of the study from the all the institutions (Department of Farmers' Welfare and Agricultural Development, Vindhyachal Bhawan, Bhopal, M.P; Department of Animal Husbandry, Kamdhenu Bhawan, Bhopal, Madhya Pradesh; Department of Agril. Statistics Government of Madhya Pradesh, Bhopal) from their published and unpublished records. The primary data were classified and tabulated in light of stated objectives of the study. The SPSS (Statistical Package for Social Science) was used for classification, analysis and tabulation of collected data.

Results and discussion

The status of fodder in Madhya Pradesh, cost and profitability of fodder and problem faced by the fodder growers are the basic areas of the study.

Status of Fodder

Fodder cultivation is found to be in a nascent stage in Madhya Pradesh. The cultivators of Madhya Pradesh devoted only their 3 per cent of gross cropped area under fodder. (Fig. 1) Out of the total fodder area (0.74 lakh ha), the cultivators of Madhya Pradesh devoted their maximum area under the cultivation of pearl millet (20%) followed by Sorghum (4%), Berseem (2%) and Maize (1%). The 72% of the fodder area is found to be covered under unidentified other fodder crops. Al though, the pearl millet which was highly cultivated by the cultivators, but it was found to be mainly cultivated for grain purposes rather than fodder. The by product of this crops is used as a fodder for the live stock.

Thus, sorghum, berseem and maize were found to be major fodder crops in the state (Fig 2). An average fodder grower of the Madhya Pradesh devoted their 1 - 2 Bigha (0.2-0.4 ha) area of cultivated land in the production of fodders in all the seasons of the year.

The area of fodder was found to be declined over the years from 974888 ha. (1990-94) to 745285 (2006-09) in Madhya Pradesh during the last 20 years (Fig. 3). The area of sorghum, berseem, loosarn, jai were found to be increased over the year 1990-94, while the area under guar and other fodder decreased in Madhya Pradesh (Table 1).

As regards to the growth of these are concerned in Madhya Pradesh, the areas of all the fodder crops were found to be decrease by 1.97% per year during the last 20 years. The growth of these fodders was found to be more in the period I (2.52%/year) as compared to period II (-2.40%/year). Among the different fodder crops the highest growth of fodder was observed in the area of loosarn (4.98%/year) followed by berseem (3.89%/ year), sorghum (2.79%/year), Jai (2.39%/year) and maize (1.99%/year) during the last 20 years in Madhya Pradesh (Table 2).

Cost of Cultivation

The cost of cultivation incurred in cultivation of major crops viz. maize (rainy season), berseem (winter season) and sorghum (summer season) by the fodder growers of different size of farm are analysed to compared the profitability of crops and find out the share of different inputs in the total cost cultivation and seems that maize is found to be a major fodder crop cultivated by the majority of fodder growers in the rainy season.

The comparative picture of cost of cultivation (Rs. /ha) of maize fodder in different size of farms was analyzed and observed that an average fodder grower invested Rs. 9264.64 /ha in the cultivation of maize and as the size of farm increased from marginal (Rs.7782.15/

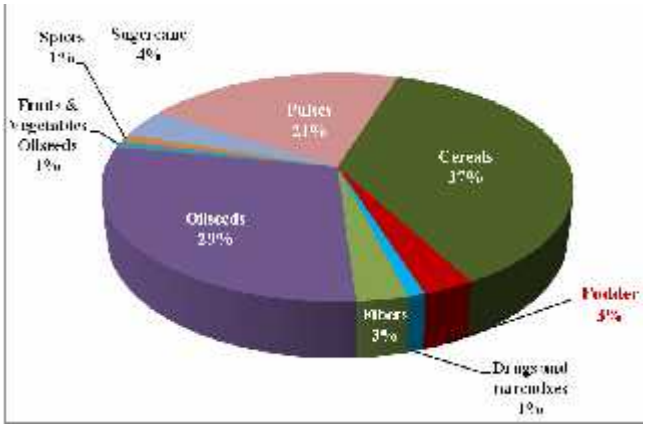

Fig 1. Share of fodder in gross cropped area (21.05 lakh ha) in Madhya Pradesh

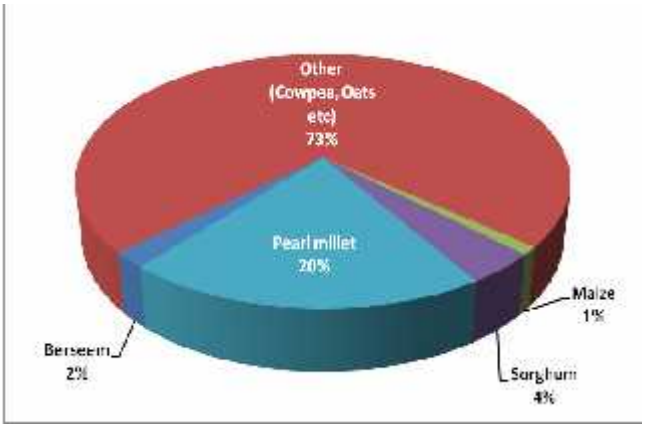

Fig 2. Share of different fodder crops in Madhya Pradesh (Total 745285 ha)

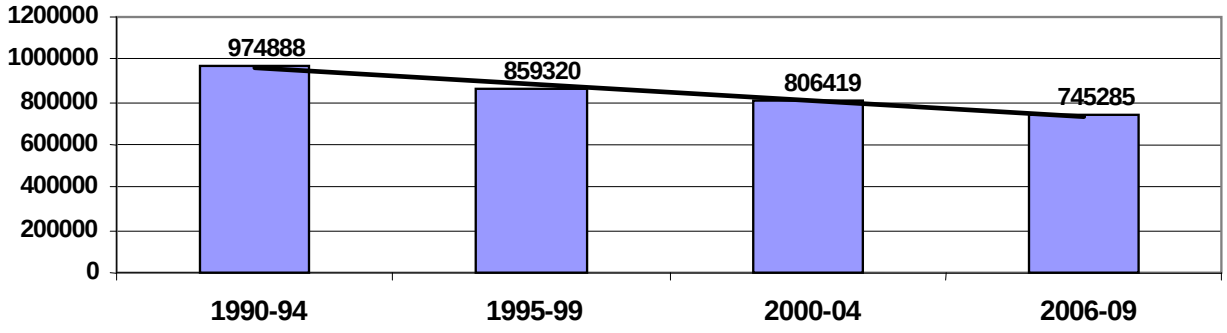

Fig 3. Area of total fodder in Madhya Pradesh (ha)

Table 1. Area of major fodder crops in different periods in Madhya

(5 year Average)

Crops	Five year average up to			
	1991-95	1996-00	2001-05	2006-10
Maize	5532	5245	6415	6326
Pearl millet	156294	140041	176951	184055
Sorghum	43338	37294	39618	37785
Berseem	13930	19721	19929	20305
Loosarn	4769	6116	7523	8192
Jai	836	472	777	1366
Guar	3573	4397	7761	1789
Others (Cowpea, Oats, etc.)	746615	646033	547445	485468

Table 2. Average annual compound growth rate of area and their coefficient of variance of major fodder crops in Madhya Pradesh

Crops	1991-1992 to 1999-00 (Period I)		2001-02 to 2009-10 (Period II)		1991-1992 to 2009-10 (Period III)	
	Growth	CV	Growth	CV	Growth	CV
Maize	-2.01	893	1.71	438	1.99	2766
Pearl millet	3.53	-11732	-1.55	-2430	-1.09	-10418
Sorghum	-5.88	8161	2.24	1793	2.79	12150
Berseem	-4.88	2191	-0.11	-34	3.89	5953
Loosarn	0.89	-48	22.68	858	4.98	925
Jai	-5.07	1668	-24.69	-5980	2.39	2779
Guar	2.89	-165771	-4.17	-88457	-3.17	-476908
Other	2.12	-25875	2.3	16482	1.42	55004
Total Fodder	2.52	-190513	-2.45	-77330	-1.97	-407749

Table 3. Cost of cultivation of maize chari (Rs/ha)

	Particulars	Marginal	Small	Semi-medium	Medium	Large	Overall
1.	Human labour						
	i) Hired human labour	67.80	94.80	1532.80	1542.40	1557.45	959.05
	ii) Family human labour	1447.80	1472.95	117.80	124.80	134.35	659.54
2.	Machine labour	1332.40	1376.15	1431.40	1492.90	1506.30	1427.83
3.	Seed	1021.30	1075.00	1147.80	1450.00	1510.00	1240.82
4.	FYM	2617.50	2946.10	3111.00	3851.25	4252.50	3355.67
5.	Fertilizer	905.60	971.10	995.00	1237.50	1487.75	1119.39
6.	Plant protection measures	0.00	0.00	0.00	0.00	0.00	0.00
7.	Irrigation	235.00	245.00	333.90	356.00	430.00	319.98
8.	Interest on working capital	58.65	62.85	66.60	76.90	83.15	69.63
9.	Miscellaneous expenses	96.10	101.10	111.25	123.75	131.45	112.73
10.	Total variable cost	7782.15	8345.05	8847.55	10255.50	11092.95	9264.64

ha) to large (Rs. 11092.95 /ha) the cost of cultivation of maize increased. (Table: 3) The farm yard manure (37%), machine labour (16%), seed (13%), chemical fertilizer (12%), hired human labour (10%) and family labour (7%) were found to be main components of cost of cultivation of maize.

As respect to berseem cultivation by fodder grower in summer season an average fodder grower invested Rs. 13835.66 /ha in the cultivation of berseem and as the size of farm increased from marginal (Rs.12716.60/ha) to large (Rs. 15159.90 /ha) the cost of cultivation of berseem increased. (Table 4) here also the farm yard manure (33%), seed (26%), machine labour (11%), irrigation (9%), chemical fertilizer (8%), hired human labour (7%) and family labour (4%) were found to be main components of cost of cultivation of berseem in the area under study.

Sorghum is found to be a major fodder crop cultivated by the majority of fodder growers in the summer season. An average fodder grower invested Rs. 9264.64 /ha in the cultivation of sorghum and as the size of farm increased from marginal (Rs.7782.15/ ha) to large (Rs. 11092.95 /ha) the cost of cultivation of maize increased. (Table: 5) The farm yard manure (32%), machine labour (16%), seed (11%), hired human labour (11%), chemical fertilizer (10%), irrigation (9%), and

Table 4. Cost of cultivation of berseem (Rs/ha)

	Particulars	Marginal	Small	Semi-medium	Medium	Large	Overall
1.	Human labour						
	i) Hired	0.00	0.00	1582.80	1592.40	1607.45	956.53
	ii) Family	1497.80	1522.95	0.00	0.00	0.00	604.15
2.	Machine labour	1382.40	1426.15	1486.40	1507.90	1516.30	1463.83
3.	Seed	3281.15	3446.20	3567.95	3982.80	4031.40	3661.90
4.	FYM	4166.30	4281.30	4531.15	4642.85	4987.45	4521.81
5.	Fertilizer	896.40	984.65	1031.40	1296.30	1506.15	1142.98
6.	Plant protection measures	0.00	0.00	0.00	0.00	0.00	0.00
7.	Irrigation	1281.15	1246.30	1246.35	1241.30	1266.30	1256.28
8.	Interest on working capital	95.10	98.20	102.30	108.45	113.40	103.49
9.	Miscellaneous expenses	116.30	122.80	124.80	128.10	131.45	124.69
10.	Total variable cost	12716.60	13128.55	13673.15	14500.10	15159.90	13835.66

Table 5. Cost of cultivation of sorghum chari (Rs/ha)

	Particulars	Marginal	Small	Semi-medium	Medium	Large	Overall
1.	Human labour						
	i) Hired	82.80	99.80	1632.80	1642.40	1657.45	1023.05
	ii) Family	1497.80	1522.95	167.80	224.80	284.35	739.54
2.	Machine labour	1432.40	1476.15	1481.40	1542.90	1556.30	1497.83
3.	Seed	771.30	984.30	1054.45	1234.35	1337.45	1076.37
4.	FYM	2517.50	2846.10	2996.00	3491.25	3797.50	3129.67
5.	Fertilizer	855.60	921.10	845.00	1137.50	1137.75	979.39
6.	Plant protection measures	0.00	0.00	0.00	0.00	0.00	0.00
7.	Irrigation	735.00	745.00	833.90	856.00	930.00	819.98
8.	Interest on working capital	60.75	66.05	69.20	77.85	82.60	71.29
9.	Miscellaneous expenses	146.10	146.10	146.25	173.75	231.45	168.73
10.	Total variable cost	8099.25	8807.55	9226.80	10380.80	11014.85	9505.85

family labour (8%) were found to be main components of cost of cultivation of maize the area under study.

Profitability of Fodder Crops

The comparative picture of Profitability of different fodder crops viz. maize (rainy season), berseem (winter season) and sorghum (summer season) grown by the fodder growers related to different size of farms are analysed and presented in Table 6.

The comparative picture of fodder crops showed that the cultivation of beseem was found be more profitable in the area under study in which an average fodder grower invested only Rs.13835.66/ha and received Rs. 52521.47/ha revealed that on the investment of Rs. 1.00, he got Rs. 3.80 as benefit over

Table 6. Profitability of fodder crops (Rs/ha)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Overall
Kharif fodder : Maize Chari						
Yield(qtls/ha)	238.40	258.45	271.85	284.45	293.70	269.37
Price(Rs/qtls)	96.26	96.26	96.26	96.26	96.26	96.26
Gross returns	22948.38	24878.40	26168.28	27381.16	28271.56	25929.56
Total Variable cost	7782.15	8345.05	8847.55	10255.50	11092.95	9264.64
Returns over variable cost	15166.23	16533.35	17320.73	17125.66	17178.61	16664.92
Rabi fodder : Berseem						
Yield(qtls/ha)	532.56	596.41	674.23	689.23	756.23	649.73
Price(Rs/qtls)	102.13	102.13	102.13	102.13	102.13	102.13
Gross returns	54390.35	60911.35	68859.11	70391.06	77233.77	66357.13
Total Variable cost	12716.60	13128.55	13673.15	14500.10	15159.90	13835.66
Returns over variable cost	41673.75	47782.80	55185.96	55890.96	62073.87	52521.47
Summer fodder : Sorghum Chari						
Yield(qtls/ha)	218.40	228.45	261.85	274.45	283.70	253.37
Price(Rs/qtls)	101.03	101.03	101.03	101.03	101.03	101.03
Gross returns	22064.95	23080.30	26454.71	27727.68	28662.21	25597.97
Total Variable cost	8099.25	8807.55	9226.80	10380.80	11014.85	9505.85
Returns over variable cost	13965.70	14272.75	17227.91	17346.88	17647.36	16092.12

Table 7. Problems related to the production of fodder crops (Multiple response)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Overall
Seed Quality	83.33	80.00	60.00	70.00	76.66	74.00
Input delivery	96.66	83.33	76.66	60.00	53.33	74.00
Expenditure on production	70.00	76.66	83.33	80.00	73.33	76.66
Insect-pests and diseases	10.00	6.66	13.33	16.66	20.00	13.33
Technical knowledge	83.33	80.00	60.00	70.00	76.66	74.00
Access to credit	6.66	13.33	16.66	20.00	80.00	27.33
Availability and cost of labour	83.33	76.66	60.00	60.00	60.00	68.00
Government Policies	13.33	16.66	70.00	76.66	83.33	52.00
Processing of fodder	100.00	100.00	100.00	100.00	100.00	100.00

the variable cost, while he received only Rs. 1.80 and 1.69 on investment of Rs. 1.00 respectively from the cultivation of maize and sorghum.

The maximum net return from the cultivation of berseem (Rs. 52521.47/ha) as compared to cultivation of maize (Rs.16664.92/ha) and sorghum (Rs. 16092/ ha) was obtained. It is also observed as the size of farm increase the cost of cultivation, gross profit, net profit increases.

Problems faced by the fodder growers

The various problem which faced by the fodder grower in the cultivation and preservation of fodder are presented (Table 7) and observed that none of the sample fodder grower done preservation practices for preservation of fodder for lean period. Lack of technical know how (76.66%) was found to be the biggest problem observed during the course of investigation and reported by the maximum numbers of respondents in the area under study.

The inferior quality of seed (74.00%), faulty input delivery system (74.00%), high expenditure in production due power cuts (74.00%), non availability of skilled labour in time and high cost of labour (68.00%), faulty government policy as distribution of mini kits of fodder seeds from veterinary department instead of agriculture department (52%) were the other major problems found in the study area reported by the majority of the respondents. The similar findings also observed by Dost Muhammad (2001).

Hence, it is clear that the fodder cultivation has not shown too much progress in the state since 1990 although it is found profitable in the state. The cultivators still growing fodder in the line of crop cultivation and the majority of them were not known the recommended package of practices of fodder cultivation. The fodder growers were also found to be not done fodder preservation techniques viz. hay and silage making for the lean period. They were not found cultivating fodder in commercial line as none of them involved in marketing of fodder in the state. Hence, it is the right time that state government re-intensified their efforts in progress of fodder in the state because without introducing dairy based faming system approach at the farmers' farms, their income should not became double, which is the ultimate target of the state government. It is only system of farming which was done by the farmers since long time. It not only generated income but also enhanced employment at their owned farm. The mini kit of fodder crops were found to be distributed by the animal husbandry department and they were not taking interest in the extension activities concern to the fodder, due to lack of training. It also lacks the aura of being doctor and the fodder is more inclined towards agriculture. The animal husbandry department in the state is only concerned with the treatment aspect and improvement of breeds because here lays the money. Investing interest in fodder sector will benefit the live stock owners but who cares? Hence, there is urgent need to create the a separate department for fodder development separate from animal husbandry department or merge the fodder development sector in agriculture department for better extension activities and distribution of fodder min kits with technical know-how because the cultivation of fodder is more or less similar to the cultivation of crops.

इस अध्ययन के लिये मध्यप्रदेश के सभी जिलों के द्वितीयक ऑकड़े (1990 से 2009 तक) एवं 150 चारा उत्पादकों से प्राथमिक ऑकड़े तीन अधिकतम चारा उत्पादक जिलों (राजगढ़, शाजापुर एवं उज्जैन) से एकत्रित किये गये। अध्ययन से यह ज्ञात होता है कि मध्यप्रदेश में 1990 से चारा उत्पादन में अधिक प्रगति नहीं हुई है क्योंकि चारा उत्पादक, चारा उत्पादन की अनुषंसित कृषि कार्यमाला अंगीकृत नहीं करते हैं एवं चारा को फसल उत्पादन के जैसे ही उगाते हैं। साथ ही, चारा उत्पादक, चारा संरक्षण की विधियों जैसे सूखा घास एवं साइलेज से परिचित नहीं हैं। चारा उत्पादक चारा को व्यवसायिक दृष्टिकोण से उत्पादन नहीं करते पाये गये हैं, जिससे वे इसके विपणन से अनभिज्ञ हैं। इसलिये, इस समय जब राज्य सरकार कृषकों की आय को दुगुना करना चाहती है, जो कि राज्य में डेयरी आधारित खेती प्रणाली को लागू किये बिना संभव नहीं है। अतएव, चारा उत्पादन तकनीक कृषकों तक पहुंचाने के विशेष प्रयास करना नितांत आवश्यक है, क्योंकि यह कृषक की अपनी खेती के साथ-साथ आय एवं रोजगार बढ़ाने के अवसर प्राप्त कर सकता है।

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