

STATUS AND PROFITABILITY OF FODDER CROPS IN MADHYA PRADESH

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SUMMARY

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. (Sharma H. O. and Raghuwanshi N. K. 2011) 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.

Key words : Status, profitability, green fodder, dry fodder yield

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 (Sharma H. O. and Raghuwanshi N. K.). 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. 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 M.P. 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 M.P.

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 *jowar*, *bajra*, *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, *bajra*, *jowar*, *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 has been selected purposively for the study on the basis of the highest area in fodder cultivation in M.P. (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, M.P.; Department of Agril. Statistics, Government of M.P., 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

Cost of cultivation, economics and problem faced by the fodder growers in Madhya Pradesh 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 bajra (20%) followed by Jowar (4%), Berseem (2%) and Maize (1%). The 72% of the fodder area is found to be covered under unidentified other fodder crops. Although, the Bajra 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.

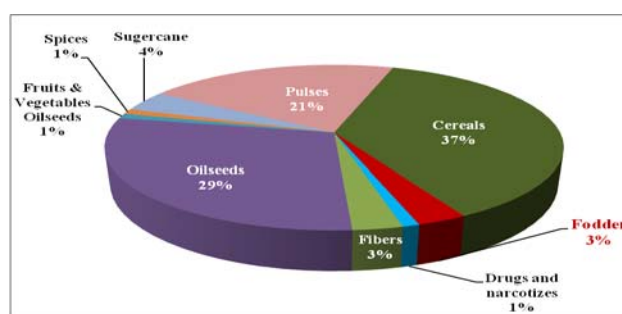


Fig. 1. Share of Fodder in Gross Cropped Area (21.05 lakh ha) in M.P.

Thus, jowar, 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 area of cultivated land in the production of fodders in all the season of the year.

The area of fodder was found to be declined over the years from 974888 ha. (1990-94) to 745285

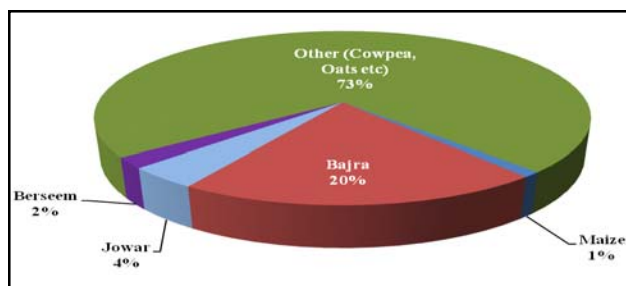


Fig. 2. Share of Different Fodder Crops in M.P. (Total 745285/ha).

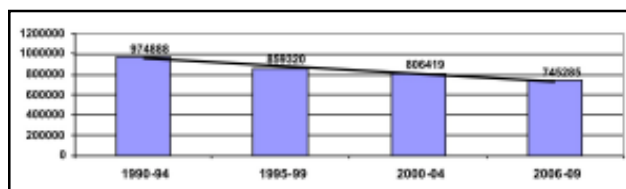


Fig. 3. Area of Total Fodder in M.P. (ha).

(2006-09) in Madhya Pradesh during the last 20 years (Fig. 3). The area of jowar, 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), jowar (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 jowar (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 input 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/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 component 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 labor (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 the area under study.

Jowar 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.

TABLE 1
Average Area of Major Fodder Crops in Different Periods in M.P.

(5 year Average)

| S. No. | Crops | Five year average up to | | | |
|--------|-----------------------------|-------------------------|---------|---------|---------|
| | | 1991-95 | 1996-00 | 2001-05 | 2006-10 |
| 1. | Maize | 5532 | 5245 | 6415 | 6326 |
| 2. | Bajra | 156294 | 140041 | 176951 | 184055 |
| 3. | Jowar | 43338 | 37294 | 39618 | 37785 |
| 4. | Berseem | 13930 | 19721 | 19929 | 20305 |
| 5. | Loosarn | 4769 | 6116 | 7523 | 8192 |
| 6. | Jai | 836 | 472 | 777 | 1366 |
| 7. | Guar | 3573 | 4397 | 7761 | 1789 |
| 8. | 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 M.P.

| S. No. | Crops | 1991-1992 to 1999-00 (Period I) | | 2001-02 to 2009-10 (Period II) | | 1991-1992 to 2009-10 (Period III) | |
|--------|--------------|------------------------------------|---------|-----------------------------------|--------|--------------------------------------|---------|
| | | Growth | C.V. | Growth | C.V. | Growth | C.V. |
| 1. | Maize | -2.01 | 893 | 1.71 | 438 | 1.99 | 2766 |
| 2. | Bajra | 3.53 | -11732 | -1.55 | -2430 | -1.09 | -10418 |
| 3. | Jowar | -5.88 | 8161 | 2.24 | 1793 | 2.79 | 12150 |
| 4. | Berseem | -4.88 | 2191 | -0.11 | -34 | 3.89 | 5953 |
| 5. | Loosarn | 0.89 | -48 | 22.68 | 858 | 4.98 | 925 |
| 6. | Jai | -5.07 | 1668 | -24.69 | -5980 | 2.39 | 2779 |
| 7. | Guar | 2.89 | -165771 | -4.17 | -88457 | -3.17 | -476908 |
| 8. | Other | 2.12 | -25875 | 2.3 | 16482 | 1.42 | 55004 |
| | Total Fodder | 2.52 | -190513 | -2.45 | -77330 | -1.97 | -407749 |

TABLE 3
Operational Cost of cultivation of Fodder crop Maize Chari of Sampled Respondents in M.P.

(Rs/ha)

| Particulars | Marginal | Small | Semi-medium | Medium | Large | Overall |
|--------------------------------|----------|---------|-------------|----------|----------|---------|
| 1. Human labor | | | | | | |
| 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 labor | 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. Misc. expenses | 96.10 | 101.10 | 111.25 | 123.75 | 131.45 | 112.73 |
| Total variable cost | 7782.15 | 8345.05 | 8847.55 | 10255.50 | 11092.95 | 9264.64 |

TABLE 4
Operational Cost of cultivation of Berseem Fodder crop (Rabi), of Sampled Respondents in M.P.

(Rs/ha)

| Particulars | Marginal | Small | Semi-medium | Medium | Large | Overall |
|--------------------------------|----------|----------|-------------|----------|----------|----------|
| 1. Human labor | | | | | | |
| 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 labor | 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. Misc. expenses | 116.30 | 122.80 | 124.80 | 128.10 | 131.45 | 124.69 |
| Total variable cost | 12716.60 | 13128.55 | 13673.15 | 14500.10 | 15159.90 | 13835.66 |

9264.64 /ha in the cultivation of jowar 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 labor (16%), seed (11%), hired human labour (11%), chemical fertilizer (10%), irrigation (9%), and family labour (8%) were found to be main components of cost of cultivation of maize the area under study.

Economics of Fodder Crops

The comparative picture of economics of different fodder crops viz. maize (rainy season), berseem (winter season) and jowar (summer season) grown by

the fodder growers related to different size of farms are analysed and presented in Table 6 and it is observed from the data that the farm yard manure, machine labour, seed, hired human labour are the main component of cost of cultivation.

The comparative picture of fodder crops showed that the cultivation of berseem was found to 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 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 jowar. He also got maximum net return

TABLE 5
Operational Cost of cultivation of Fodder crop Jowar Chari of Sample Respondents in M.P.

| Particulars | Marginal | Small | Semi-medium | Medium | Large | Overall |
|--------------------------------|----------|---------|-------------|----------|----------|---------|
| 1. Human labor | | | | | | |
| 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 labor | 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. Misc. expenses | 146.10 | 146.10 | 146.25 | 173.75 | 231.45 | 168.73 |
| Total variable cost | 8099.25 | 8807.55 | 9226.80 | 10380.80 | 11014.85 | 9505.85 |

TABLE 6
Economics of fodder crops Sample Respondents in M.P.

| 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 : Jowar 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 |

from the cultivation of berseem (Rs. 52521.47/ha) as compared to cultivation of maize (Rs.16664.92/ha) and jowar (Rs. 16092/ha). It is also observed from the data that as the size of farm increase the cost of cultivation, gross profit, net profit increases.

1. Problems which were faced by the fodder growers

The various problem which faced by the fodder grower in the cultivation and preservation of fodder are presented in 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.

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 cultivator 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 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 on 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.

TABLE 7
Problems related to the production of fodder crops, sample households

(Multiple response)

| Particulars | Marginal | Small | Semi-medium | Medium | Large | Overall |
|------------------------------------|----------|--------|-------------|--------|--------|---------|
| 1. Seed Quality | 83.33 | 80.00 | 60.00 | 70.00 | 76.66 | 74.00 |
| 2. Input delivery | 96.66 | 83.33 | 76.66 | 60.00 | 53.33 | 74.00 |
| 3. Expenditure on production | 70.00 | 76.66 | 83.33 | 80.00 | 73.33 | 76.66 |
| 4. Insect-pests and diseases | 10.00 | 6.66 | 13.33 | 16.66 | 20.00 | 13.33 |
| 5. Technical knowledge | 83.33 | 80.00 | 60.00 | 70.00 | 76.66 | 74.00 |
| 6. Access to credit | 6.66 | 13.33 | 16.66 | 20.00 | 80.00 | 27.33 |
| 7. Availability and cost of labour | 83.33 | 76.66 | 60.00 | 60.00 | 60.00 | 68.00 |
| 8. Government Policies | 13.33 | 16.66 | 70.00 | 76.66 | 83.33 | 52.00 |
| 9. Processing of fodder | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

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