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PROBLEMS AND PROSPECTS OF INCREASING BEEF PRODUCTION IN THE TRIBAL TRUST LANDS*

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IN THE TRIBAL Trust Lands cattle undoubtedly are amongst the most prized possession of the tribesmen. In many instances his livelihood depends entirely on cattle and it is, therefore, not surprising to find that cattle in one way or another form an intricate part of his religious and cultural life. Not all households own cattle, however, and this fact contributes to the scarcity value of cattle with the result that numbers are steadily increasing. At the same time the rapidly increasing human population requires more arable land; this in turn reduces available grazing area and so causes widespread and increasingly severe overstocking.

POPULATION AND OUTPUT TRENDS

By far the greatest part (i.e. c.75 per cent) of the agricultural output of the Tribal Trust Lands is utilized internally by 3,7 million people dependant on the Tribal Trust Lands for subsistence. The contribution of tribal agriculture to the cash economy is, therefore, very small, less than 10 per cent of the value of national production.

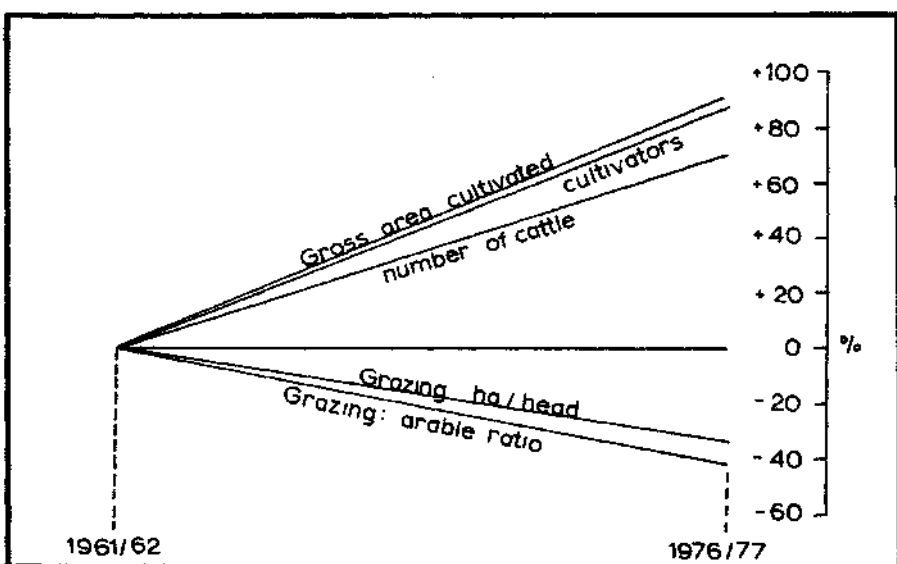
While total production shows an increasing trend, yields per unit area in most cases do not. Over the period 1961-2 to 1976-7 the approximate number of cultivators is estimated to have increased from 395 000 to 675 000 — an increase of 88 per cent. The gross hectarage under cultivation increased by 91 per cent, from 1,15 million (Phillips, 1962) to 2,2 million. And in view of the key role of cattle for draught and manure for arable farming, it is not surprising to find that cattle numbers since 1961-2 have increased by 70 per cent from 2,0 million to 3,4 million.

Although the total area of the Tribal Trust Lands has increased from 13,5 to 16,3 million ha, the gross cattle-stocking rate expressed as hectares per head has deteriorated from 6,2 : 1 to 4,1 : 1 — a decrease of 34 per cent. The ratio of cultivated arable to grazing has narrowed from 1 : 10,8 to 1 : 6,4 ha and that of the number of cattle per cultivator has narrowed from 1,7 : 1 to 1,5 : 1. These trends are illustrated on the following diagram.

*This is an edited version of a paper delivered to the Fourth Rhodesian Science Congress in September 1977.

Figure 1

LAND-USE TRENDS IN T.T.L.s : PERCENTAGE CHANGE IN VARIOUS FACTORS

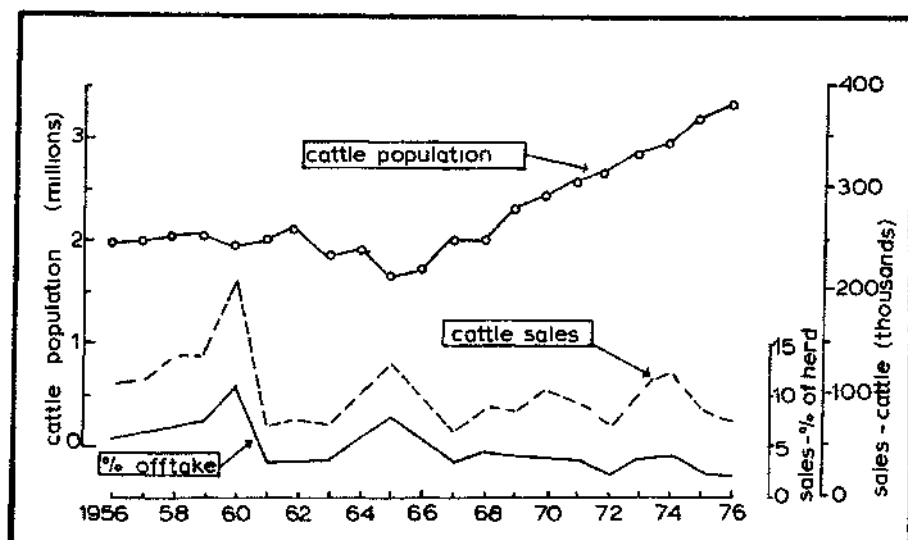


Source: Stubbs (1977).

The trends in Figure 1 clearly show that whereas the number of cultivators increased with a corresponding increase in arable land, more cattle were required to cultivate these lands, and at the same time, grazing area has decreased. When account is taken of the fact that 90 per cent of the area of the T.T.L.s falls in Natural Regions III to V and when adjustment is made for waste land and unusable area, it is evident that the overstocking of the grazing area has seriously worsened over the past fifteen years. Consequently draught for tillage and manure for fertility have both declined. The effect of these pressures is detrimental both to cropping practices and to beef production from the cattle herd. The trend of beef production is illustrated in Figure 2.

While the number of cattle has increased by 70 per cent, the annual off-take in the form of sales steadily decreased from an average of about 7 per cent to less than 3 per cent over the last fifteen years. Mortality and slaughtering of cattle for consumption is estimated to be approximately 4 per cent (it is difficult to obtain reliable estimates of deaths as in many cases the beast will be slaughtered when it is realized it is not going to survive).

Figure 2

CATTLE NUMBERS, SALES AND PERCENTAGE OFF-TAKE
FROM T.T.L.s

Source: Stubbs (1977).

CONSTRAINTS LIMITING PRODUCTION

Before an assessment can be made of constraints limiting production it is necessary to appreciate the varied role of cattle in a subsistence economy in which they:

- Provide agricultural draught power, which is perhaps the most important consideration in keeping cattle on the land.
- Assist in the maintenance of soil fertility and soil moisture conservation.
- Provide some form of return from land largely unprofitable for agricultural production except through livestock.
- Enhance food supplies by providing milk, and to a lesser extent, meat.
- Satisfy cultural needs in the form of prestige, religious ceremony, security, and bride price; as fewer households own cattle, this function is rapidly losing its significance.

Danckwerts (1974) in a survey conducted in the Victoria Province came to the conclusion that the tribal herd is not primarily a beef-producing herd. He pointed out, however, that, because of the multiple uses of cattle as set out above, the annual return on investment appears to be in the region of 30 per

cent. This return compares most favourably with investment in cattle in commercial farming.

In the European economy, on the other hand, cattle are kept to provide a cash return. Cattle on European ranches are sold to recover input costs including overheads, such as roads, fencing, water supplies and an interest on investment as well as direct costs such as dipping, labour and feed. But in the tribal economy input costs of cattle are very low and seldom exceed the annual dipping fee; the need to sell cattle to recover direct input costs, therefore, is minimal.

Even though cattle are considered a valuable asset, few family units possess enough cattle to be self-sufficient in draught. In Table I cattle ownership by family unit is given, but it must be kept in mind that, because of 'split' ownership, the cattle may not actually belong to the 'owner'. Wealthy businessmen or those with well-paid jobs elsewhere are using the tribal areas as a holding ground for their stock and, due to their absence, no efforts are made to improve management.

Table I

CATTLE OWNERSHIP BY FAMILY UNIT : VICTORIA

<i>Number of Cattle Owned</i>	<i>Percentage of Family Units</i>
None	44.2
1-5	20.4
6-10	19.0
11-15	9.2
16-20	3.0
Over 20	4.2

Source: Danckwerts (1974).

Although this sample was drawn from a relatively small area, it is doubtful if on a national basis these figures would deviate to any significant degree.

In view of the importance of draught in the T.T.L.s, one would expect to find a relatively large percentage of oxen in the tribal herd. From the data presented in Table II, however, it can be seen that only 21 per cent of the tribal herd consists of oxen and that 42 per cent are followers and non-productive in that they are either too young to produce a calf or too small to pull a plough. The percentage of calves in this survey is remarkably high and indicates that fertility of the tribal herd has not been affected by the adverse conditions to the degree that animal scientists would expect.

Table II

HERD COMPOSITION: VICTORIA

<i>Type of Animal</i>	<i>Percentage of Herd</i>
Bulls	5,5
Cows	30,8
Oxen	21,4
Heifers	17,1
Steers	7,0
Calves	18,2
	<u>100,0</u>

Source: Danckwerts (1974).

From the data presented in Figures 1 and 2 and Table II, it is estimated that on average one ox cultivates three hectares annually. In view of the importance of oxen, their percentage, as well as the percentage of the replacement steers, is low. Unless a family unit owns more than ten head of cattle they have insufficient draught power and manure to ensure good crop growth. Thus 80 per cent of all family units are not self-sufficient in draught and manure.

The system of cattle marketing in Rhodesian Tribal Trust Lands probably has no equal in Africa and marketing agencies dealing with other commodities could possibly learn from it. However, whereas the 7,5 per cent marketing charge, which includes transport, is acceptable, the 10 per cent levy to raise funds for part of the development and administration of T.T.L.s is a considerable disincentive. For example, the total cost of fattening a 400 kg grade X ox (i.e. purchase price, feed cost, veterinary charges, insurance, and transport cost for 80 km) is Rh\$112,13. The return that may be expected when the beast is sold to the Cold Storage Commission is as follows:

	Rh\$	Rh\$
Selling price (263 kg @ Rh\$0,5287 per kg)		139,05
Production cost of beast	112,13	
African Development Fund levy	13,91	
		<u>126,04</u>
Profit (excluding labour)		13,01
Percentage return on investment:	11,60	

The cattle fattener does not consider Rh\$13,01 sufficient for the risk and labour involved. This small return undoubtedly played a large part in the substantial reduction in cattle fattening in the Victoria Province. During the 1972-3 season tribal farmers in the Victoria Province fattened and sold over 11 000 head direct to the Cold Storage Commission. This figure has now

42 PROBLEMS AND PROSPECTS OF INCREASING BEEF PRODUCTION

dwindled to less than 2 000 in 1975-6, although there is some evidence that cattle are marketed through unofficial channels to avoid the levy payment. If this levy were removed in the example used above, the profit would be Rh\$26,92 or 24 per cent on investment and the proposition becomes more attractive.

At present too many cattle of poor quality are sold at the Internal Affairs sale pens and this represents a loss of potential income that cattle fattening could avoid.

At the cattle sales organized by Internal Affairs the Cold Storage Commission is the residual buyer and prices are guaranteed. At the sales the bidding in the past commenced at a guaranteed price based on mass and grade. From January 1976 a minimum mass qualification was placed on young stock for the selected young-stock grades. If an animal fails by 5 kg to qualify for the selected grades, the price reduction can be as high as 50 per cent. As more than a quarter of all stock sold in the past were young stock, the new ruling came as a serious financial blow to the producer. Thus 44 per cent fewer young stock were sold during the year 1976 compared with the previous year.

The drier parts of the country are the areas producing the most cattle. These, however, are the areas where foot and mouth disease appears to be endemic. During periods when areas in the south-eastern lowveld were free of foot and mouth disease restrictions, up to 10 per cent of the tribal herd was sold, and these cattle were generally of good quality. Since 1975, however, few cattle have been sold in the south-eastern lowveld. Tick control at present is governed by law but sometimes the dip tanks are poorly sited and too many cattle are dipped at a tank.

It is not clear to what degree water shortage during the dry season has affected cattle production, but it can be assumed that during the hot months the lack of sufficient water adversely influences milk production and growth. Furthermore, areas around watering points are severely overgrazed and thus when water is available grazing may be limited and vice versa.

Cattle husbandry methods in the T.T.L.s, when compared with what is known and practised in the sophisticated farming community, can only be described as primitive. In a society where the older and less educated people are the cattle owners, a certain amount of resistance to change is to be expected. The cattle owner seldom actively participates in the management of his cattle which are generally left to the younger children to herd and dip. Poor management of the calf and cow, also undoubtedly leads to high calf mortalities. Even if the cattle owner wishes to accept new methods of husbandry and production, he can do little more than castrate, possibly de-horn and treat wounds; because grazing is communally owned there is limited scope for improvement of the grazing and hence the condition and output of cattle.

In areas where grazing schemes have been accepted and in fact implemented, the initial results have been most encouraging. However, the inclination was to increase stock numbers to utilize the improved veld rather than to maintain the original stocking rate. In many instances, the stocking rate almost doubled; nevertheless an improvement in the condition of cattle was noticeable between those cattle on grazing schemes and those on unmanaged communal grazing. Because of severe shortages of extension staff and a worsening of the political situation, many grazing schemes have collapsed: few if any schemes in Victoria Province, for example, continue to function.

Milk is a valuable source of protein in the tribal areas and often it is the only significant source of animal protein for children. Because of the tremendous demand for milk, little attention is given to the needs of the calves. Many die and those which do survive have their growth severely retarded.

In tribal areas animal growth is severely retarded owing to the poor nutritional conditions caused by overgrazing. In this connection, Vorster (1964) showed that it may take up to ten years for an ox in the T.T.L.s to reach a mass of 500 kg. The same type of animal when kept on a commercial ranch may reach a mass of 500 kg in four years or less. Heifers similarly may be five or more years of age before producing their first calf compared to heifers in a commercial herd which produce their first calf at three years of age.

Management programmes to develop the cattle industry in the tribal areas have been very slow for a number of reasons. Among these are the severe shortage of trained personnel and the lack of options. On the other hand, where the extension staff have concentrated their efforts on training master farmers, a certain amount of success has been achieved.

MEASURES TO INCREASE PRODUCTION

In order to substantially increase production from the tribal areas it is essential to relieve pressure on the land. At present many people are farming at subsistence mainly because of lack of job opportunities and in order to retain security of tenure. These ineffective cultivators occupy large areas of land that could otherwise be utilized profitably by the master-farmer type of farmer. A large population shift from the tribal areas to urban areas or growth points within the Tribal Trust Lands is therefore required. To achieve it, sufficient employment opportunities must be created and, most important of all, security of tenure must be granted (both in existing and newly-developed lands) to avoid a drift back to the tribal areas when retirement age has been reached. How this intended shift should be brought about is outside the scope of this paper.

The system of communal tenure has hampered production and development. In this respect it is of prime importance to introduce security of tenure

and negotiability as soon as possible. This will ensure that those farmers who are successful will be able to take over non-productive land from other farmers either by working agreement or outright purchase and thus bring a low-producing area into reasonable production.

Because of its disincentive effect, the African Development Fund levy should be modified. Marketing depots should be established where all produce (this is, both cattle and all types of grain crops) can be marketed. These depots should be sited in close proximity to existing business centres which are located on recognized bus routes serviced by good roads. The existing cattle-marketing system serves as an example.

Modifications are required to the mass and price criteria in the marketing of young stock in order to avoid the drastic effect of the current standards. By adopting a gradual change in prices the confidence of the producer is sustained.

Foot and mouth disease at present severely restricts marketing. Ideally, corridors free from cattle should be used to divide the tribal areas into sectors to contain an out-break of foot and mouth, but the cost of maintaining such corridors, would be exorbitant. The alternative would be to construct a new abattoir at either Rutenga, or at the lowveld complex of Chiredzi, to provide slaughter facilities for the foot and mouth endemic areas of the south-eastern and Beitbridge lowveld areas.

The importance of draught in the tribal areas has been emphasized. To increase the amount of draught and at the same time reduce the grazing pressure on the land, a cattle exchange scheme supported by the Cold Storage Commission should be introduced. Weaners properly reared on the 'calf rearing system' are sold by the producer. Well grown oxen are made available to the producer and the proceeds from the sale of the calf are used as a deposit. These oxen so obtained are trained for draught purposes and after they have provided the much needed draught to grow a crop these oxen are fattened by the farmer or are entered into a feedlot in a co-operative basis. By replacing non-productive young stock with oxen the herd composition can be changed so that the majority of the animals are of beneficial use to the tribal farmer.

An immediate solution to the draught problem would appear to be to introduce tractors, but it must be remembered that only when cash crops, such as cotton with a high monetary yield per ha, are grown will it be to the advantage of the grower to contract plough; when crops are grown solely for subsistence, it may not be economically feasible to do so, and only limited areas are in fact suitable for the cultivation of high-yielding cash crops. Irrigation schemes, especially if fairly large plots are cultivated, may benefit from mechanical draught, but if only 0,1 ha is being cultivated, too much land is lost simply for manoeuvring the tractor.

Numerous cattle are sold unfinished in the tribal areas. To minimize the

loss of potential beef, the Cold Storage Commission (or some other profit-sharing group) should operate feedlots in the tribal areas where cattle in low condition that would normally have been offered for sale are fattened. To overcome the farmers' immediate need for cash, 'credit' proportionate to the value of the beast at the commencement of the feeding period would be advanced to the farmer. It is important that the farmer participate in the scheme on a profit-sharing basis. The Cold Storage Commission should also increase its services to the butcher shops in tribal areas to relieve the need for slaughtering stock in the tribal areas.

The distances between dips should be reduced and in fact the aim should be to dip no more than 1 000 head of cattle at a dip. At the same time it is essential to re-design the whole dip tank complex to include more pens and a well designed race and bail for use by all farmers. The necessary facilities should be made available at the dip tank, for vaccinating, branding and dosing cattle. In this way, the image of the dip tank will change and, it is hoped, improve the attitude towards dipping.

Milk is a valuable source of protein but not enough is available in the T.T.L.s; this puts a tremendous strain on the tribal resources. If milk could be made freely available through depots established in recognized business centres, and from localized dairy production, the pressure on the tribal 'dairy' cow would lessen and a much higher calf survival and growth rate would result.

The tribesman, for reasons already mentioned, is reluctant to sell his cattle. The approach therefore should rather be to make more feed available to the cattle through (a) grazing schemes and pasture improvement; (b) irrigation schemes; and (c) drought-resistant crops. The establishment of grazing schemes need not be emphasized here, as it has already proved to be successful. The introduction of pasture legumes will make a significant contribution to increasing carrying capacity and therefore beef output. Irrigation schemes of the 150 ha size in the more densely-populated areas should be more widely introduced. Those people taking up irrigation land should be encouraged to relinquish their ownership of arable land which should be restored to grazing. At irrigation schemes, large quantities of crop residues are produced, which could be used as cattle feed. Insufficient research has been done on drought resistant crops, the successful cultivation of which would make available more residues for cattle feed. Plans, such as those drawn up by the Agricultural Development Authority, provide for large-scale stock-watering reticulation schemes in drier parts of the country. Large tracts of land may thereby become more productive.

To bring about a change in the management skills, required to conduct a successful programme of cattle production, farmer participation will be of vital importance and considerably greater amounts of training of the cattle owner will have to be done through intensified extension programmes or

training centres. The training of farmers should be aimed at labour intensification and success will be achieved if visible results are produced in a short space of time. Training should be aimed at short-term animal and land inputs as well as long-term inputs.

Short-term extension inputs will include instruction on storage of will come about only when population pressure has been relieved by sufficient alternative job opportunities in urban areas, as well as security of freehold cow as well as draught animals. Also the importance of the provision of water during the dry season, although recognized, will need stressing, as will disease control. The long-term animal inputs should cover subjects such as the construction of proper feed-storage shelters, proper housing of animals, shelters for milk cows, and a selection programme promoting indigenous-type sires.

Short-term inputs favouring land development should include reclamation of worked-out arable land by planting it to recognized ley pastures and the introduction of grazing schemes. Long-term inputs favouring land development includes pasture renovation through introduction of legumes, production of legume fodder crops such as cowpea hay, proper fencing of grazing areas and silage production such as scotch silage.

The majority of these recommendations involving farmer participation are in various stages of implementation but the level of adoption is very low mainly because of insufficient training and lack of staff. In addition to general training of farmers, the Master Farmer movement should be expanded and a national body should be created for farmer representation; this would enhance the image of the Master Farmer and encourage more farmers to improve their farming standard to qualify as a Master Farmer and thus achieve a higher output of cattle.

EXPECTED IMPROVEMENTS

It must be emphasized that a really significant improvement in the tribal areas will come about only when population pressure has been relieved by sufficient alternative job opportunities in urban areas, as well as security of freehold tenure in urban areas and the Tribal Trust Lands. These moves require significant legislative changes.

The benefits to be derived from implementing the proposed facilities requiring Government participation in providing the initial capital outlay can only be estimated; but the benefit to the community as a whole will serve to stabilize and encourage production. While it is difficult to place a monetary value on improvements resulting from implementation of all the recommendations, some estimates are possible:

Marketing:

	Rh\$
(i) Modification of levy	800,000
(ii) Stabilization of young stock market	600,000
	<hr/> 1,400,000

Disease Control: An abattoir in the foot and mouth endemic areas will increase cattle sales from the tribal areas alone by more than Rh\$1 million per year.

Cattle Exchange Scheme: This scheme in the early stages will increase sales by 15 000 head contributing approximately Rh\$150 000 to the tribal economy a year.

Feedlots: Approximately 20 000 head can be fattened in the early stages, contributing directly to the tribal economy income of Rh\$2 million a year.

Dipping Services: It is not possible to give a fair estimate of the direct or indirect benefits that may be derived from the improved dipping service.

Dairy Marketing Board Depots: Since not every one is going to stop milking the tribal cow, it is estimated that with milk freely available an additional 10 per cent calves can be raised. This in the long term will yield an additional 54 000 head annually, as well as improving the health of the consumer.

Feed Production and Veld and Pasture Improvement: Additional feed will undoubtedly benefit the cattle industry but no reliable quantitative estimate can be given. Initially, increases in fodder production will improve the condition and productivity of cattle rather than increase numbers in view of the fact that many areas are already overstocked.

Stock Water: Once again it is not possible to estimate quantitatively to what extent the additional stock water facilities will benefit the cattle industry.

Staff and Farmer Training: With farmer participation and with an adoption rate as low as 10 per cent of better management practices, the herd composition can be altered to push the proportion of oxen up to 40 per cent of the herd and so decrease the proportion of young stock. The off-take of cattle could increase from the present 3 per cent to about 11 per cent from those farmers who have accepted a change in management practices. On a national basis this represents an increase in production of almost 30 per cent or Rh\$1.8 million.

Draught: The total value of draught is estimated to be of the order of Rh\$24 million per annum. If say, 10 per cent of draught animals were released by the provision of mechanical tillage, it is estimated that beef production would increase by Rh\$4.5 million per annum.

The direct measurable benefits derived from the implementation of the recommended practices can be summarized as an estimated increase in the value of beef production as follows (Rh\$ million):

48 PROBLEMS AND PROSPECTS OF INCREASING BEEF PRODUCTION

Marketing	1,40
Disease control	1,00
Cattle exchange scheme	0,15
Feedlots	2,00
Dipping improvements	?
10 per cent draught replacement	4,50
20 per cent milk replacement	5,40*
Feed production	?
Stock water development	?
Training and extension	1,80
TOTAL	Rh\$17,25 million
Percentage increase in sales	270,8
Value of milk from beef cows	1,50†
Value of draught	24,00††

* About 54 000 calves more will be produced of good quality. This represents a figure of 8 per cent increase in calf crop overall.

† 1,5 pints average by 50 per cent of cows for 200 days at 10c per pint.

†† Rh\$12 per ha A.D.F. rates (The Whitsun Foundation's estimated cost is Rh\$20 per ha.).

SUMMARY

Since 1962 there has been a considerable increase in the arable in the tribal areas. This increase in arable has resulted in an ever-increasing demand for draught animals which in turn resulted in a decrease in cattle being sold. About half the cattle in the tribal areas are non-productive, i.e. they do not plough or are too small to produce a calf. To reduce the number of non-productive animals various recommendations such as calf rearing, a cattle exchange scheme, increased fodder and water supplies and improved animal health are recommended for tribal areas.

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