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CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

TECHNICAL ADVISORY COMMITTEE

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AN INTERNATIONAL BUFFALO RESEARCH INSTITUTE

(Secretariat Note)

(Agenda Item 6)

TAC SECRETARIAT

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

ROME, 1975

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AN INTERNATIONAL BUFFALO RESEARCH INSTITUTE

(Secretariat Note)

I. The Importance of buffalo in world animal production.

In recent years the potential of the buffalo both as a milk and meat producing animal has been stressed and it has been emphasized that the buffalo has not received adequate research attention in the past, especially in biew of its importance to the group of developing countries in Asia some of which are among the least developed countries.

Although cattle numbers have increased by 12.8% from 1961/65 to 1972, as compared to an 8.6% increase in buffaloes (Table 1), one should bear in mind that cattle have a considerable wider world distribution than buffaloes which are confined to specific ecological and climatic conditions.

TABLE 1

World cattle and buffalo numbers in '000 head

	1961-65	1972	Increase, %
Cattle	1,016,249	1,165,413	12.8
Buffalo	115,607	126,484	8.6
TOTAL	1,131,856	1,291,897	

Source: FAO Production Yearbook 1972, Vol. 26, 1973

As can be learnt from Table 2, 96.6% of the world buffalo population is found in 15 countries which are mainly situated in Asia.

The decrease in numbers cannot be explained for Thailand and Sri Lanka, while in Vietnam war may have reduced the buffaloes. Turkey has favoured cattle production as can be seen in Tables 3-5.

The use of the buffalo as a domestic animal is for three purposes: milk, meat and draught which are alwasy closely linked together as no specialized breeds have been selected; however the river buffalo of Pakistan and India has been selected for milk production whilst still being a good beef and draught animal. The swamp buffalo of Southeast Asia has not been bred for a special production purpose and much more resumbles the wild ancestors than the former.

TABLE II

WORLD DISTRIBUTION OF BUFFALOES - 1972

Area	Country	No. in Thousands 1961-65	No. in Thousands 1972	Increase or Decrease over 1961-56 - %
Asia	India	51,873	54,800	+ 5.4
	China	28,318	29,680	+ 4.6
	Pakistan	8,974	12,720	+ 29.5
	Thailand	6,859	5,800	- 15.4
	Philippines	3,357	4,711	+ 28.8
	Nepal	2,838	3,500	+ 19.0
	Indonesia	2,846	2,850	+ 0.1
	Vietnam, D.R.	1,485	1,700	+ 12.7
	Burma	1,117	1,620	+ 31.1
	Turkey	1,162	1,062	- 8.6
	Laos	527	950	+ 44.5
	Kmer	596	800	+ 25.5
	Sri Lanka	855	710	- 17.0
	Bangladesh	505	700	+ 27.7
	Vietnam, Rep.	810	560	- 30.9
Total main buffalo breeding countries		112,122	122,163	+ 8.2
Total Asia		113,184	123,382	+ 8.3
Total Africa (Egypt)		1,559	2,200	+ 29.1
Total U.S.S.R.		385	460	+ 16.3
Total Europe		407	295	+ 27.5
Total Central & South America		72	147	+ 51.0
Total World		115,607	126,484	+ 8.6

Source: FAO Production Yearbook, 1972, Vol. 26, 1973

TABLE III

MILK PRODUCTION FROM BUFFALOES

Area	Country	Buffalo 1961 - 65	Milk, 1000 MT 1972	Increase or decrease 1972 over 1961-65, %
Asia	India	11,507	15,000	+ 23.3
	Pakistan	5,385	7,680	+ 29.9
	China	938	1,008	+ 6.9
	Nepal	385	420	+ 8.3
	Bangladesh	303	420	+ 27.9
	Turkey	277	270	- 2.5
	Philippines	13	15	+ 13.3
Total		18,808	24,813	+ 24.2
Total Asia		18,959	25,004	+ 24.2
Total Africa		756	1,035	+ 24.2
Total World		19,791	26,086	+ 24.4

TABLE IV

COMPARATIVE NUMBERS OF MILK PRODUCTION FROM COWS AND BUFFALOES
1972

Area	Country	Cow Milk 1000 MT	Buffalo Milk 1000 MT	Ratio of Cow Milk to to Buffalo Milk
Asia	India	8,100	15,000	0.54
	Pakistan	2,841	7,680	0.37
	China	3,369	1,008	3.34
	Nepal	220	420	0.52
	Bangladesh	3,582	420	8.53
	Turkey	2,350	270	8.70
	Philippines	14	15	0.93
Total		20,476	24,813	0.83
Total Asia		28,682	25,004	1.15
Total Africa		10,180	1,035	9.84
Total World		374,822	26,086	14.37

TABLE V

COMPARATIVE NUMBERS OF BUFFALO & CATTLE SLAUGHTERED FOR MEAT * - 1972

Area	Country	No. in Thousands Cattle	Buffalo	Relation between head of buffalo slaughtered to head of cattle (1:)
Asia	China	9,665	2,980	3.24
	India	840	820	1.02
	Pakistan	1,285	450	2.86
	Indonesia	1,100	390	2.82
	Philippines	464	212	2.19
	Turkey	2,528	202	12.51
	Thailand	450	200	2.25
	Vietnam, D.R.	90	183	0.49
	Nepal	91	103	0.88
	Burma	575	81	7.09
Total, main buffalo slaughtering countries		17,088	5,621	3.04
Total Asia		23,878	5,988	3,98
Total Africa		18,023	726	24.8

Source: FAO Production Yearbook 1972, Vol. 26, 1973

* No data are available on actual meat production as buffalo meat is listed together with beef.

II. Proposals for an International Buffalo Research Institute submitted to TAC by the Governments of the Philippines and Pakistan

The advice of the FAO Animal Production and Health Division was sought on the evaluation of the two proposals and this was given by Dr. W.R. Cockrill, editor of "The Husbandry and Health of the Domestic Buffalo", and a recognized authority on buffaloes, and by Dr. Ian Mason of the Livestock Research and Education Service.

Dr. Mason makes the following comments on the Philippines proposal:

"With a threatened world shortage of grains, concentration of efforts on ruminants is clearly going to be necessary. With increasing demand for beef and milk the various bovine species must have preference. The emphasis up to now has been on cattle: the other species of bovines, which all have adaptation to special conditions, now deserve attention both in research and development. The water buffalo is the most numerous and most widespread and the case for increased research on this species is very strong. An international research centre, if it could could command more and better staff than the present national centres, certainly merits support. However, in view of the factual inaccuracies in this presentation, is the Philippines the correct venue? Also, can one centre cope with all the specialized research listed on p. 14-15? Possibly a centre in South-east Asia for the Swamp buffalo, one in India for the dairy buffalo and one in South-east Europe for meat production might be desirable.".

Dr. Cockrill comments:

"The requirements for such a centre are carefully enumerated in the proposal document and it is indicated that a location which would meet these requirements could be made available. The growing urgency of the need for research, and for internationally oriented investigation and coordination is rightly stressed. Emphasis is given to the importance of buffalo meat production and to the need to increase supplies of animal protein from this source. My personal view is that the project woudl be more suitable for bilateral support. However, Philippines would not be the country of my choice: I would advocate, in this order, Sri Lanka, Indonesia, Pakistan, India. The possibility of three individual centres, as mentioned by Mason, has decided attractions."

Regarding the Pakistan proposal Dr. Cockrill remarks:

"In a well-reasoned document, dated June 1974, the Government of Pakistan have submitted a proposal for the establishment of an International Buffalo Research Institute to be located at the existing premises of the Livestock Experiment Station, Qadirabad, Punjab, Pakistan. This is a well-known centre which, over the years, has conducted much useful research. In the opinion of the present writer it has never been adequately funded, and is capable, if given the necessary support, of expanding the scope and value of its work.

There is a herd of high-yielding Nili-Ravi buffaloes at the Station, numbering about 500 in all. Buildings and land area are adequate, though additional laboratory space would be required. Facilities for artificial insemination and reproduction research are good.

The location of Qadirabad is not, in the writer's opinion, entirely suitable for an international centre. It is relatively isolated; the nearest town, Sahiwal, is about 20 km distant. There are over 20 distinct breeds of water buffalo, by far the greater majority of which are found in India. Much of the research would require the importation of nucleus stocks of these breeds into Pakistan. These considerations need not rule out the selection of Qadirabad. They are mentioned only to put the station into perspective with other institutes which might be considered."

"On balance, as between Pakistan and Philippines, Pakistan would be the favoured location. A well-established livestock and research station is offered, together with extensive facilities. The physical proximity to India where the majority of buffalo breeds are located, and where some important buffalo research is current at several institutes, is an added advantage.

It might be remarked that the staff of the Asian Centre for Livestock Development (UNDP) is reviewing the possibilities for improved buffalo husbandry in the countries of the region and is formulating proposals for the establishment of national buffalo research and training centres which would ultimately link with the proposed international centre. The reports of the group will, it is understood, be available in the near future."

Regarding the opinion expressed at the Eighth Meeting of the TAC, that further information on on-going buffalo research work was still required, Dr. Cockrill points out the following:

"It is unlikely that, in the time available before the next meeting of the TAC, any reliable information relating to investments by governments in buffalo oriented research will be forthcoming. This really requires a detailed study with visits to representative institutes and to appropriate government departments, or the distribution of a questionnaire.

It can be said that disproportionately little research is directly related to buffaloes at the present time. A certain amount of research in the cattle field is of relevance to buffaloes also. Without first hand investigation it is not possible to assess the importance and the financial implications of this relationship."

Dr. Cockrill is doing what he can by correspondence to obtain the type of information sought by the Committee, but is not hopeful that much of value will be forthcoming by the first week of February - or indeed, at all, without on-the-spot investigation. He may be able to obtain information from a few countries during planned travel early in 1975, but it will not cover the important areas of India, Pakistan, the Near East and Europe.

III. Justification

An increasing number of recommendations have been made during recent years and strong support for an International Buffalo Research Institute has been evinced at several meetings. The following may be cited:

1. XIX International Dairy Congress, New Delhi, India - December 1974.

Unpublished proceedings.

The need for research in buffaloes was stressed and an international centre was advocated to put emphasis not only on the improvement of buffalo production, but also on the technology of milk and milk products and meat.

2. International Buffalo Conference, Caserta, Italy - 7 - 9.11.1974.

Unpublished proceedings.

The establishment of an International Buffalo Research Institute was discussed and recommended.

3. Second Meeting of the FAO Animal Production and Health Commission for the Near East, Nicosia, Cyprus - 2 - 9 June 1971.

Recommendation No. 8/71 - The Meeting recommendeds:

"That, since the buffalo was the principal milk producer in a number of countries of the Region, and, in the management, health, physiology and improvement of which, there were a number of important problems, FAO should give support to any national projects undertaking research and improvement programmes in connection with this animal."

4. Report of the Fifth Regional Conference on Animal Production and Health in the Far East, Kuala Lumpur, Malaysia - 20 - 27 September 1971. Recommendation No. 4 reads:

"The Conference on Animal Production and Health in the Far East, Kuala Lumpur, Malaysia - 20 - 27 September 1971. Recommendation No. 4 reads:

"The Conference wishes to stress the importance of the water buffalo in the great majority of countries in the Region. It strongly urges FAO to continue to emphasize the need for, and to encourage, research programmes on buffalo production, with particular reference to breeding programmes, health, pasture utilization and production economics."

Recommendation No. 6 reads:

"Because of the efficiency of the water buffalo as a converter of coarse fodder and its adaptability to the hot humid tropical environemnt, greater emphasis should be placed on this animal as a producer of meat as well as milk. The need for further research programmes on buffalo production, with particular reference to breeding programmes, reproduction, health, pasture utilization and production economics is recommended."

5. Provisional Indicative World Plan for Agricultural Development. FAO, Vol. 1, 197

This accentuates the importance of the buffalo as a draught animal which aspect has achieved even higher priority with the present oil crisis.

It reads (Chapter 5, para. 76):

"Despite the rapid growth in demand for meat and milk the primary role of the bovine in Asia up to the end of the Plan period is likely to be that of a source of energy for agriculture, and notwithstanding the assumptions adopted by the IWP concerning the growth of mechanization there is unlikely to be a dramatic decline in the numbers of draught animals, especially in India and Pakistan. Although it appears that a good deal could be done to increase the productivity and working efficiency of these animals by better feeding, and by improvement in the design of animal-drawn equipment, there are important cost and psychological barriers which limit the speed at which such improved equipment can be introduced. The situation will be rendered more difficult by the increasing fragmentation of holdings likely to result from the growth of the rural population. In the long run the only solution to a worsening situation seems to be a drastic programme to enlarge the effective size of operational units. This would both increase the efficiency of use of working animals (which are often kept on holdings of an uneconomic size),and improve the opportunities for the introduction of mechanization."

The same report draws attention to the bottlenecks of milk production from buffaloes if a comprehensive research programme on most principles of buffalo production were not initiated (Chapter 5, para. 77):

"The necessity of retaining a large herd for breeding draught animals limits the prospects for a dramatic growth in milk production from indigenous stock in a number of countries, particularly in Asia. Where the dairy industry has a very small base and the environment is favourable, rapid growth may be feasible from the importation of exotics such as Murrah Buffaloes to Ceylon and the Philippines, and European dairy breeds to Taiwan and South Korea. The rate at which progress can be made in this type of programme is likely to depend upon the success achieved in defining and implementing a breeding policy beyond the F1 stage. This, in turn, will be influenced by the availability of feed and the level of nutrition practised."

IV. Approach

It should be debated whether or not India would be more suitable as host country of an international buffalo research centre, as there are considerably more buffaloes (1972, 4.3 times more) than in Pakistan and more breed varieties are available (14 compared to 2 in Pakistan).

The following points should be considered in this connection:

1. The first step in the development of an international buffalo research centre must aim at setting priorities for research and initiate the implementation of projects. This action is not dependent on buffalo numbers and varieties, but rather on breeds which promise results in a relative short period. Both Pakistan breeds, the Ravi/Nili and Kundi breed, are improved and it is understood that production data which could soon be evaluated have been collected from large herds for many years. The high producing Indian breed, the Murrah buffalo, belongs to the same group as the former ones.

2. As India is so large,an International Buffalo Research Institute would probably have to concentrate its research in the beginning on only one buffalo group, which would most likely consist of the Murrah or Gujarat breeds, and the Uttar Pradesh, Central and South Indian varieties would thus not benefit immediately from an institute.

3. After an initial research programme is implemented investigating the major production aspects of a few main breeds and testing the potentials of buffaloes under different production systems, an International Buffalo Research Institute must regionalize its efforts in order to obtain as much information on the buffalo as possible. This could be accomplished by:

   a. building up a coordinated network of smaller stations in other areas of Asia with important buffalo production;

   b. closely cooperating with national buffalo improvement programmes in Asian countries;

   c. combining a) and b) and even collaborating with Egypt, Brazil and European countries which have fairly high buffalo populations.

4. If high-producing breeds have been identified in different areas, a crossbreeding project should be started at the buffalo research centre to test for heterosis effects. This would make the transfer of animals of various origins to the centre necessary.

5. If the TAC decides on the establishment of an International Buffalo Research Institute it should be remembered that in the case of Pakistan or India the Institute would almost exclusively have to concentrate on river buffaloes which would probably make the establishment of an associated institute for swamp buffalo research desirable in South-east Asia.