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Livestock breeding policy: Implementation, constraints and future prospects in Maharashtra

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Abstract

In India, sixth five year plan (1980-85) appealed the states to frame their own breeding policy and implement. Accordingly all the states of India formulated their state breeding policies. On similar lines, Maharashtra proposed its state breeding policy in 2006 and revised in 2010. This visionary breeding policy acts as a light house for breeding of different species of livestock in different agro-climatic zones of Maharashtra (India). The policy highlights selective breeding, grading up and crossbreeding giving a special emphasis to cattle and buffalo breeding. However, livestock species *viz.*, goat, sheep, poultry, equine and pigs too find their place in the policy decision. In spite of meticulous planning of the policy, a Meager genetic improvement is evident in livestock sector of Maharashtra. This review highlights the considerations in implementation of Maharashtra State Breeding Policy-2010 and the measures to overcome constrains associated.

Keywords: Maharashtra, breeding, policy, constrains

1. Introduction

Maharashtra ranks seventh with respect to livestock population. According to 20th Livestock census, the total livestock population in the state is 33 million, of these 13.3 million are cattle, 5.6 million buffaloes, 10.6 million goats and 2.7 million sheep (www.dahd.nic.in)^[1]. These four species of livestock forms the backbone of the economy in semi-arid agro climatic zone of Maharashtra for a marginal farmer. The state has a rigid breeding policy in operation since 2010 (State Livestock Policy 2010)^[9]. This livestock breeding policy deals with all species of livestock with special emphasis on cattle and buffalo. The silent features of the policy include selective breeding for native germ plasm, up gradation in breeding tract and crossbreeding restricted to exotic inheritance of 62.5% in areas with ample greens.

Though the directives has being laid down by the government on breeding of animals for enhanced productivity, there are few constrains in implementation of the policy at field level. The major constrain is the livestock holdings in terms of both, number and pattern. The average livestock holding for a marginal farmer as reported by experts is around 2-4 (Kuralkar *et al.*, 2015; Bhagat *et al.*, 2022)^[2, 7] with the range of 1-10. The farmers prefer to rear cattle and buffalo together. Within the cattle species there could be a crossbred (of different level of exotic inheritance), pure native, non-descript (ND), graded or even combination of either of these. Even two types of indigenous animals are reared by livestock owners in same flock. Mix type of livestock is observed with the farmers (Jadhav *et al.* 2022)^[6]. With this handful of varied combination of livestock, the farmer/stakeholder is seldom serious about breeding the right animal to a right one.

2. Implementation of breeding policy

The limitations in execution of breeding policy are not only region specific but also species specific. They start right from the willingness of the farmer to abide to guidelines laid down and extend up to availability of quality semen of elite livestock especially for native breeds. Species wise constrain in breeding and genetic improvement are discussed in this manuscript.

2.1. Crossbreeds

With the advent of White revolution in India, crossbreeding (CB) evolved too. Jersey, Brown-

Swiss and Holstein Friesian (HF) were the choice of exotic cattle used for crossbreeding initially of which Jersey and HF with varied degree of exotic inheritance (50%, 62.5%) are presently used for crossbreeding in Maharashtra (ICAR Handbook of Animal Husbandry) [5]. Following are few constraints associated with implementing crossbreeding in Maharashtra can be discussed under following headings.

2.1.1. Identifying exotic level of inheritance: In the field conditions, where there is absence of pedigree records, it is very difficult to judge the exotic level of crossbreds, which is a major problem for breeding policy implementation. At such situations, the decisions relies on the convenience of the AI worker

2.1.2. Negligence of AI worker: There are many non-technical field workers who are unaware of the breeding policy and hence negligent towards execution of same. For example, though the level of exotic inheritance is restricted to 62.5%, it may not be practically followed.

2.1.3. Semen doses: The semen doses are often in shortage either due to demand-supply gap or due to technical issues. Sometimes, though the doses are available, specific dose required for AI (*eg.* a particular inheritance level for a Jersey or HF) may not be available The available doses are either of inferior quality or not acquired from elite animals as there is no provision of progeny testing under field condition.

2.1.4. Unlawful semen doses: In areas like western Maharashtra as there is ample cattle genetic resource, there has evolved a trend of private practitioner, so have evolved the service providers who sell semen doses of non-certified bulls. These doses are locally available at cheaper rates and so preferred. But the eliteness and quality of these semen doses is under question.

2.1.5. Inbreeding: Due to Natural Service (NS) or even due to no replacement policy of bulls at Semen stations, many off-characters and genetic defects propagate in the population attributed by inbreeding.

2.2. Indigenous cattle

The cattle genetic resources of Maharashtra comprises of seven breeds of cattle *viz.*, Deoni, Red Kandhari (RK), Khillar, Dangi, Gaolao, Kathani and Kokan Kapila (www.nbagr.res.in) [3]. They are distributed in their breeding tract in a pocketed fashion. There are even buffering zones where breeding tract for two or more breeds coincide. Following are the limitations in execution of selective breeding, upgrading for the indigenous germ plasm.

2.2.1. Semen doses: Availability of semen doses is the most prevalent problem for AI of native breeds. The doses are either not available or are available in limited amount. Further, the quality of the doses is an issue. If the quality is good, the animals used for semen collection are not elite and selected based on the physical appearance which may be misleading and performance potential of the pedigree which is often not reliable. The pocketed distribution of these animals itself is a challenge for the government to reach every native animal and inseminate for genetic improvement. For some newly registered breeds like Kathani and Kokan Kapila, the semen collection has yet to be initiated.

2.2.2. Breed identification: This may be a problem for AI workers unaware of breed characters and breed distribution. Wrong categorization of an animal will definitely lead to a wrong decision. There could be ambiguities in identification of a Balankya variety of Deoni against Gaolao which an average AI worker may not be able to differentiate.

2.2.3. Breed mixture: This is a major problem specially in buffering area wherein there is a breeding tract of two or more breeds *eg.*, Deoni and RK both are distributed in parts of Nanded and Parbhani. In such areas breed mixture are commonly seen either due to unsupervised natural service (NS) or even by farmer's choice.

2.2.4. Inbreeding: Due to presence of limited population that too distributed in pockets, there had been inbreeding in most of the native population. Experts believe that some of the natives have deteriorated their phenotypic appearance, size and stature. There is also propagation of genetic defects due to limited population, unplanned NS and non-replacement of breeding bull at semen station from time to time.

2.3. Buffalo

Buffaloes are predominantly seen in Asia and India in particular. Best of the buffalo breeds of World are Indian pride. The state breeding policy suggests selective breeding and upgrading of ND with Murraha, Surti and Jafrabadi in Maharashtra. The buffalo breeds of Maharashtra are Nagpuri, Pandharpuri, Marathwadi and Purnathadi (www.nbagr.res.in) [3]. The constraints in buffalo breeding can be discussed as-

2.3.1. Breed identification: There are minor differences in the buffalo breeds of Maharashtra and it is difficult for a field vet to differentiate the breed and use proper germ plasm for AI. This may lead to production of breed mixtures.

2.3.2. Semen doses: There is a huge gap between demand and supply of semen doses for buffaloes and hence at field level it is difficult to follow the breeding policy.

2.3.3. Import of animals: Commercial dairy producers, to fulfill their short term requirement of milk, prefer to purchase buffaloes from Hariyana and Gujarat. But these animals' adoptability is in question. They usually produce well for a limited period and then they are culled due to various complications attributed to non-adoptability. Ultimately, though elite, these animals do not contribute to the genetic improvement of the area.

2.3.4. Genetic defects: They are generally owing to inbreeding

2.4. Small Ruminants

Poultry sector of livestock industry is solely managed by stakeholders. Sheep and goats are mainly reared under extensive range management system on community rangeland, crop residues and forestlands employing self or family labour (www.ahd.maharashtra.gov.in) [10]. The only way by which government can make a change in the gene pool of these animals is by introduction of germ plasm by state Agriculture University (SAU), State Veterinary University (SVU) or Punyashlok Ahilyadevi Holkar Sheli Va Mendhi Vikas Mandal.

The goat genetic resources of Maharashtra include Sangamneri Osmanabadi, Magdyal and Berari while there is

only one registered breed of sheep *viz.*, Deccani. Following are the problems associated with breeding and genetic improvement in small ruminants. Though no rigid policy have been formulated for the breeding of small ruminants, guidelines suggest selective breeding for native and up gradation of non-descript (ND).

2.4.1. Inbreeding: This forms an apex problem for small ruminants. The flock size for small ruminants range from 5-20 for goats (Gokhale *et al.*, 2002) [4] and 50-80 in sheep (Yadav *et al.*, 2015) [11]. However, if the males are not replaced from time to time, there are issues of inbreeding in the flock which may lead to propagation of off breed characters in the flock.

2.4.2. Breed mixture: Hybrid type of animals are often seen on the fields.

2.4.3. Non-descript animals: There are many ND which need to be categorized as a breed.

2.5. Poultry

According to National Action Plan for Egg & Poultry. (2022) [8], well organized commercial sector of poultry accounts to about 80 percent of total market share contributed by poultry industry over nation and 20 percent of the market share is credited by unorganized poultry populations in villages referred as backyard poultry. Out of nineteen identified chicken breeds in India, only one has been registered from Maharashtra. Most of the fowl population is thus considered as native or desi. These birds breed within themselves and have been bred naturally since generations. The stakeholder is seldom concerned about the production performance. Those who want to earn a profit from poultry business either prefer to purchase commercial broilers or layers or even modified backyard birds like Vanraja, Giriraja, Gram-priya, Kaveri, *etc.* developed by different research institutes.

3. Conclusions

With all these limitations as hindrances in execution of formulated breeding policy, we can expect only a small genetic gain per generation in the livestock. With these constrains in backdrop, it is difficult to manage ND population which is present on a large scale in India. When India talks of zero Non-descript population, Maharashtra has to take up its task of breed identification and meticulous management of semen doses to ensure reaching every corner of the state. The major thrust must be on counseling of farmers and imparting knowledge about breed characters and breeding policy to AI workers (Government as well as private).

4. Future prospects

All constrains mentioned above can be eliminated gradually by working on each one of them. It is necessary to select elite bulls of native cattle by semen station and replacement of the bulls from time to time promptly. This will overcome the problem of inbreeding and also the problem of unavailability of semen doses of native germ plasm. The un-organized sector of dairy has to be converted to an organized sector by having a close monitoring on use of breeding bulls and their replacement in government organization as well as on field. To bring about a considerable improvement in the production performance of small ruminants, farmer's group breeding schemes can be created allowing them to exchange breeding males in flock. This will reduce inbreeding in the stock as

well as it will help the livestock owner curtail the expenditure on purchase of replacement breeder male frequently. A lot of work is needed to be undertaken in poultry sector to define and classify the chicken population of Maharashtra. Any breeding policy for breeding/up gradation of native chickens can be undertaken only after proper classification of these native birds based on their origin and /or characters.

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