

The self-management organization as a way for the *in situ* conservation of native poultry genetic resources

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ABSTRACT

Objective: To identify local organization strategies employed by peasant women to conserve their native hens.

Methodology: Informal dialogues were held with five peasant women from the rural community of La Cuchilla, Nopala de Villagrán, Hidalgo, Mexico. The information collected was analyzed based on self-management organizational elements. Likewise, the proposals of three authors were used as a foundation for the analysis of the community organizational points in question, with the aim of strengthening the self-management organization.

Results: Peasant women use specific self-organization strategies to conserve their native hens, which are considered of great value as a result of their resistance to diseases and their adaptation to the local feeding and environmental conditions. Based on the findings and the authors consulted, an analysis framework is proposed to design of actions that strengthen the self-management participation of women in the conservation of their native poultry resource.

Study Limitations: Further studies about women self-management organization mechanisms in rural communities aimed at the conservation of their resources are recommended. The said studies will enable a more complex description of their functionality, potential, and cooperation mechanisms, among other elements that strengthen their structure.

Conclusion: The mechanisms of self-management organization have great potential for the local and community conservation of native poultry resources.

Keywords: poultry farming, self-organization, native hens, rural community.

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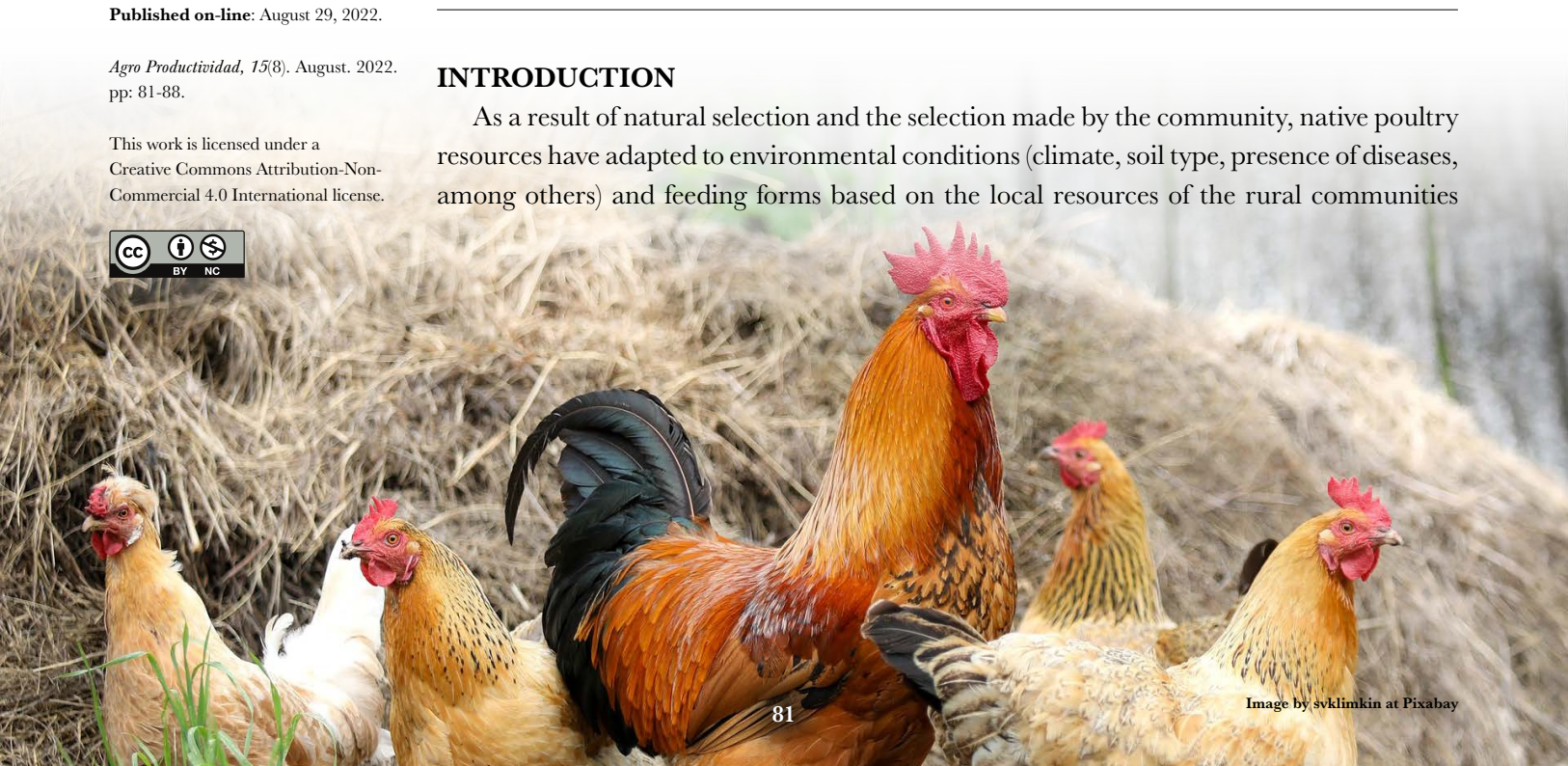
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INTRODUCTION

As a result of natural selection and the selection made by the community, native poultry resources have adapted to environmental conditions (climate, soil type, presence of diseases, among others) and feeding forms based on the local resources of the rural communities



where they develop. Consequently, native poultry have acquired characteristics that the people who use this kind of birds consider valuable (Camacho *et al.*, 2016). Likewise, these genetic resources have evolved together with the social, economic, cultural, and management knowledge of the people who have used them in a specific context. In other words, these resources have not only represented an accumulated genetic heritage, but also local lore that reflects the cultural and historical identity of the communities that developed them; these resources are an integral part of their life and traditions and they have co-evolved with an environment and concrete production system (FAO, 2010).

Nevertheless, several causes have contributed to the loss of these genetic resources. Among them, the uncontrolled crossbreeding between native animals and stocks—animals genetically selected to increase their production—stand out. These stocks have been introduced as part of projects or programs designed by external agents that have exacerbated comparisons between native breeds and stocks, diminishing the productive characteristics of breeds adapted to the local environment. In its turn, this situation has led to the transformation of traditional systems into systems oriented to the use of external inputs (Animal Production and Health Division, 1998; FAO, 2007).

Given this scenario, native breeds must be considered as valuable genetic material that needs to be maintained and improved, based on appropriate national policies and programs for genetic resources conservation. A low-cost alternative to achieve this conservation is *in situ* conservation—which consists of actions where the breed continues to occupy the environment in which it has been developed (Animal Production and Health Division, 1998).

In situ conservation measures highlight the need to recognize the value and importance of local production systems; these systems should be supported, given their importance for the maintenance of these zoogenetic resources (FAO, 2007). To achieve this objective, two measures are necessary: on the one hand, the elimination of factors that contribute to genetic erosion; and, on the other, the promotion of the exchange of ideas, the interaction and dialogue between indigenous and rural communities and scientists, public servant, and other stakeholders, in order to combine traditional lore with scientific approaches (FAO, 2010).

Not only the production systems *per se*, but also the people who develop them are considered important in the measures recommended for *in situ* conservation, since the lore, innovations, and organization of the farmer, indigenous, and local communities are valuable, pertinent, and necessary for the conservation and sustainable use of the domestic animal diversity (SAGARPA, 2002).

FAO (2010) has recognized the importance of the rural community members' lore and management for the *in situ* conservation of native genetic resources. However, the guidelines that it has proposed for conservation plans (Animal Production and Health Division, 1998) seem to have an approach from above (government) to below (community), which leaves aside the functionality and potential of the self-management organization methods of the people who use the resource and who make up the community (appropriators). For example, the proposals made by external agents fall into the following categories: 1) the creation of programs and strategies established by the government, 2) experts, 3) associations, 4)

cooperatives, and 5) organizations that work with the community to conserve the native genetic material (Animal Production and Health Division, 1998). Consequently, these guidelines consider that the appropriators should be directed by a bureaucratic-like level and not by themselves.

Drawing an analogy with Ostrom's (2000) statement about the possibility of handling common use resources (CUR) through a self-management organization, we can glimpse viable ways for the conservation of native genetic resources, not only through external or bureaucratic agents, but also directly by the users of the resources themselves.

For example, Ostrom (2000) considers that a group of individuals could cooperate with each other and govern themselves to make a rational use of forest, fishery, or livestock CURs, without necessarily fulfilling the predictions of the tragedy of the commons, the prisoner's dilemma, and the logic of collective action —three models that indicate the impossibility of collective action and the unlimited use of resources in a limited world, where the objective is to maximize profits and satisfy self-interest.

This situation opens the possibility that self-management organization can also be considered as a way to conserve resources.

The objective of this exploratory study was to identify the existence of local organization strategies aimed at the conservation of native hens in a rural community.

MATERIALS AND METHODS

Study area

This exploratory research work was carried out in the La Cuchilla community, in the Nopala de Villagrán municipality, Hidalgo, Mexico. Informal dialogues were carried out with five women who had poultry in the community, in order to explore and learn about the value they assigned to native birds and their local forms of conservation and repopulation. The information collected was analyzed based on Ostrom's proposal (2000) about the elements that favor and strengthen the self-management organization. Based on Ostrom (2000), Wolf (1981), and Agarwal and Narain (1997), the organizational points to be considered for the community-level self-management organization were analyzed, including: 1) criteria for the consolidation of the interest group, 2) recognition of the appropriators' local lore, and 3) identification, recognition, and strengthening of binding contracts (local arrangements, system of rules).

RESULTS AND DISCUSSION

An example of a self-management organization for the conservation of native birds

The peasant women put great value on the Native hens as livestock element, because they have characteristics that fit the production system in which they have developed, including rusticity, resistance to diseases, and natural instincts such as brooding (an important characteristic for the natural reproduction of the species). Furthermore, native hens satisfy the needs of small producers, given the important use value that the community attributes to them. Native hens fulfill social (strengthening interpersonal ties between members of the family and the community), cultural (eggs and meat used in traditional medicine),

economic (higher economic value than birds of improved genetic lines), nutritional (poultry products with characteristic and natural flavor), and recreational functions.

Despite their importance, these hens had been replaced by stocks to “boost” food production in rural communities, based on programs that have diluted the existing local genetic material. In response to this situation, some of the peasant women—who are part of the community and maintain bonds of friendship or family ties—organized themselves into a small group to protect their livestock resource and promote its reproduction through the following actions: a) do not include hens from government packages in their production unit, b) exchange among themselves native hens and roosters from the same community for reproduction purposes, and c) establish a mechanism for the incubation of native birds that consists of the collection of native eggs which were subsequently incubated by female turkey. Small producers who did not have female turkey in their production unit could take advantage of the following share cropper mechanism: a producer with female turkey would have them incubate the eggs of the producer that did not and the number of hatched chicks would be divided between the two producers.

The abovementioned data provide a glimpse of the interest of women in CUR conservation, through specific self-organized actions aimed at a common good.

In this sense, Ostrom (2000) mentions that the potential cooperation among a set of individuals for the rational use of CURs depends on a series of internal elements that influence the individual decisions about each subject: a) costs and benefits of the individuals’ actions and their link with the expected results, b) CUR provision and appropriation over time, that is, the different activities required to maintain the resource, as well as their allocation (task and resulting resources division), c) the discount rate, that is, the value given to immediate or future benefits, and d) external elements, such as the reduction of uncertainty (lack of information). In the specific case of the handling of eggs from native hens—taking up again the elements proposed by Ostrom (2000), which stimulate cooperation between people—, it is possible to determine that the strategies established between women had their origin in the shared value given to the resource, as a way to solve problems that were perceived as such and in the interest of obtaining a long-term benefit from it.

Likewise, the established strategies indicated that resources were allocated according to the participation of each member: each woman obtained the resources that matched the activities that she had carried out. Ostrom (2000) also mentions that the creation of provision, credibility/trust, and supervision mechanisms can, in turn, favor and strengthen stable self-management institutions. In the case of this study, we were able to identify that the women who made up the group had a previous bond of trust, either because they were family members or friends.

In accordance with the proposals of Ostrom (2000), it is possible to elucidate that the users of the resource themselves can design the long-term and small-scale CUR-conservation actions, discarding the assumption that individuals are incapable of cooperating with each other for a common good (Ostrom, 2000).

In this sense, Palerm (2000) proposes the existence of two types of self-managed administration for the management of a CUR (such as water): 1) cases where the operation

and other activities are carried out by the users of the resources themselves, and 2) cases where the users of the resource hire specialized personnel for the operation. The particular implications of each type of self-management are taken into consideration; for example, when the type of self-management is carried out by the users of the resource themselves, in a small-scale context, but limited by the needs of technical capacity and specialists, no type of bureaucratic administration is necessary. Making an analogy with the analysis and proposal of Palerm (2000), it is possible to determine that small-scale systems that involve peasant women who own poultry can be fixed by setting up a simple self-management organization and carrying out the tasks with the help of the members themselves. The previous theories demonstrate the importance of recognizing and making visible the self-management option of the CUR users themselves and valuing its innovation capacity (Palerm, 2000).

Organizational elements for the conservation of native poultry genetic material as a CUR

Based on Ostrom (2000), Wolf (1981), and Agarwal and Narain (1997), we propose the following organizational elements to design actions that strengthen self-management participation in the conservation of native poultry genetic material as a CUR at community level:

1. Criteria for the consolidation of the interest group

In order to determine the feasibility of the implementation of collective actions for the use and exploitation of a CUR (*e.g.*, native hens), the elements proposed by Ostrom (2000) for the consolidation of interest groups can be considered: a) the minimum number of participants necessary to obtain a collective benefit, b) participants with common or similar interests that encourage internal cooperation, and c) the interest that future generations obtain future benefits from the said resource. Consequently, the actions proposed for the reproduction, use, and exploitation in common of the native poultry resource can be considered and modified by the interest group to achieve its long-term conservation.

Unlike Wolf (1981) —who considered that the persistence of corporate organizations relied on tradition and obligation and that they sought to find a balance (evening out their opportunities and risks among their members, based on their internal function)—, we conjecture the possibility that stable self-management organizations have their origin in the existence of groups that can voluntarily organize themselves through self-organized collective actions. Therefore, the origin of these organizations may arise from their internal needs to regulate and maintain their resources, rather than from external pressures or any historical precedent.

2. Recognition of the resource users' local lore

The identification and recognition of the local lore about the CUR will provide information that will influence the actions and decisions that will be taken for its conservation. The foregoing will help to avoid affecting the discount rate, as well as

reduce the uncertainty of the long-term existence of the resource. Therefore, the information obtained will allow the design of actions and technologies appropriate to a specific reality aimed at achieving the common benefit. In this sense, Agarwal and Narain (1997) consider that modern science and technology, along with the essence of high productivity, have led to the relegation of lore, traditional cultures, and ancient ecological rationality, resulting in technologies with high ecological costs. In this case, the dilution of genetic material (loss of biodiversity) is an example of a highly negative ecological impact.

Therefore, nowadays it is essential to develop technologies that are suitable for the appropriators, that respond to their needs, and that are consistent with the social, cultural, economic, and environmental context of the locality, in order to increase the feasibility of conserving a CUR (Agarwal and Narain, 1997).

3. Identification, recognition, and strengthening of binding contracts (local arrangements, rules system)

Taking Ostrom (2000) up again, the organization may last in the long term, not because they continue with a traditional model, but rather as a result of the function type and dynamics of its structure, whose rules do not remain static, but undergo dynamic changes, where a system of rules, trial, and error can be experienced. The organizational balance will be the result of their agreements and compliance with the rules, the arrangements reached between the individuals involved, and the possibility that those affected by the operating rules can participate in its modification.

Likewise, since the people interested in the conservation of a CUR created the rules themselves, they supervise each other as a result of their own interest, and consequently determine if the common good can be achieved through long-term joint work.

Face-to-face communication within the organization is necessary for the establishment and operation of binding contracts. It places a high and important value to the actions or strategies shared by others (shame, guilt, among others), which increases the probability of establishing coherent agreements that define the role and rewards of each individual. Consequently, the CUR is not overexploited in the process and there is a clear definition of the expected costs and benefits.

Reciprocity, trust, and communication are components that can favor and strengthen cooperation between individuals for the rational use of the CUR. Based on the approach proposed by Ostrom (2000) for the study and analysis of whether or not institutions successfully manage common use resources, a glimpse of the dynamics between individuals and the links they establish through reciprocity, trust, and communication can be achieved, as well as how, in turn, they build an organization that seeks to achieve a long-term common good.

Ultimately, the recognition, respect, and strengthening of the local arrangements established by the organized groups for the conservation of the CUR will allow greater control of the decisions and designs of their own contracts, along with equal opportunities to use the resource in question.

4. External recognition of the organization’s rights

Although the existence of self-management organizations does not depend on any external authority, external authorities must recognize the minimum rights of the organizations. In other words, external government authorities should not question the rights of the appropriators to build their own institutions.

Actions proposed to strengthen self-management organizations that work for the conservation of native hens in the La Cuchilla community

To strength the self-management organization in La Cuchilla and taking into account the abovementioned organizational elements, it is proposed the following elements.

The previous proposal aims to make visible and strengthen the self-management organizations of women in the community, as a way to conserve their native hens. It should be emphasized that further studies about the ways in which peasant women in rural communities organize themselves for the conservation of their native poultry resources are required. These studies use an analytical framework —such as the one proposed in this study— to achieve a more complex description of their functionality, cooperation mechanisms, lore, binding contracts, and rules, among other elements, to determine

Table 1. Proposals to strengthen self-management organizations for the conservation of native birds in La Cuchilla, Nopala de Villagrán, Hidalgo, Mexico.

Organizational elements	Proposal
Criteria for the consolidation of the interest group	To identify peasant women who: <ul style="list-style-type: none"> • Have native hens in their production unit. • Are interested in the use, reproduction, and sale of native birds • Value the benefits, both tangible and intangible, that they can obtain from native hens.
Recognition of the appropriators’ local lore	To identify, determine, and complement the knowledge that peasant women have regarding: <ul style="list-style-type: none"> • Phenotypic characteristics that distinguish native birds from “improved” birds. • The use of alternative incubation mechanisms to improve the number of chicks born (turkey hens, broody hens, among others). • Time of the year in which more birds are born (March-July). • Knowledge of the natural behavior of the native hen (brooding, feeding type, egg laying age, molting period). • Local forms of reproduction • Climatological characteristics for the best reproduction of birds • Indicators of success The aforementioned lore is little known by technicians or professionals, because they no longer work with these birds on a large scale.
Identification, recognition, and strengthening of binding contracts (local arrangements, system of rules)	<ul style="list-style-type: none"> • Definition of chick care and production practices. • Definition of the number of eggs to collect, incubate, and distribute. • Vertical-type organizations (a group that breeds them, a group that reproduces them, a group that sells them) with the possibility of rotating activities. • Mechanisms for the transmission of knowledge. • Dissemination of information. • Definition of the criteria that determine who can have access to the birds. • Definition of cooperation forms for the collective purchase of food, vaccines, and equipment that also lower the costs of these activities.

their potential and consequently take them into consideration and recognize their own organizations and their rights.

CONCLUSIONS

The participation of the community is essential for the *in situ* conservation of various zoogenetic resources. Nevertheless, the actions aimed at achieving it hardly consider the self-management organization that the community has or can develop as an effective way of conservation. The information obtained in this study shows the self-organization strategies that peasant women use to favor the conservation of their native hens, to which they attach great value due to their resistance to diseases and their adaptation to local feeding and environmental conditions. This situation helps to identify self-management as a way to conserve resources. Further studies about the self-management forms that women in rural communities use to conserve their native poultry resources will enable a more complex description of their functionality, potential, and cooperation mechanisms, among other elements that strengthen their structure.

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