



# Review on the Tibetan *Hordeum Vulgare L.* Production Culture Transformation Mechanism from the Perspective of Actor-Network Theory

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**Abstract.** Study of the Tibetan *Hordeum vulgare L.* production culture can enrich the research methods and perspectives of Tibetan production culture. Based on actor-network theory, this paper studies the characteristics, trends, motivations, translation process and actor-network of the Tibetan *H. vulgare* production culture transformation. The results are as follows. Firstly, the cultural transformation of the *H. vulgare* production in Tibet exists objectively, and relevant research needs to classify the consensus reached among the actors of the cultural transformation about the *H. vulgare* into physical culture, institutional culture, behavioral culture and mental culture. Secondly, from the perspective of human actors, this paper studies the features, laws and trends of the cultural transformation of the traditional Tibetan *H. vulgare* production. Thirdly, from the perspective of non-human actors, this paper studies the direct and mediating effects of the *H. vulgare* production cultural transformation in Tibet, and emphasizes that the cultural transformation of the *H. vulgare*, and that is the result about the combined effects of external and internal dynamics. Fourthly, to unify the research framework of the cultural transformation of the *H. vulgare* production in Tibet, it is critical to seek a theory that combines the interrelationships among influencing factors and their actor network dynamics. The results can be transformed into strategies that ensure a characteristic and innovative development path of the Tibetan *H. vulgare* production culture.

**Keywords:** The Tibetan *Hordeum vulgare L.* production culture · Actor-network theory · Transformation · influencing mechanism · Tibet

## 1 Introduction

Tibetan culture has a long history, and Tibetan culture is an important part of Chinese culture. As part of Tibetan culture, Tibetan production culture plays an important role in Tibet's economic and social development. Tibetan production culture has the characteristics of cultural capitalization [1], and it has become an important resource for

local governments to enhance their competitiveness. Meantime, the *Hordeum vulgare* L. culture has a long history of cultivation [2,3]. So it is the foundation of farming in Tibet, and it is also a characteristic crop in Tibet [4]. Many studies have considered the selection, breeding, planting and processing of the *H. vulgare*, but there are few studies on the production culture related to the whole process from planting to processing of the *H. vulgare*. At the same time, existing studies have shown that the ecological carrier often bears cultural functions, and that the Tibetan *H. vulgare* culture also represents the unique cultural factors in China [5]. Meanwhile, the Tibetan *H. vulgare* production culture constitutes the foundation of Tibetan culture and influences the traditions and customs of all ethnic groups on the Qinghai-Tibet Plateau. The *H. vulgare* production culture is also the bond that maintains the identity of the Himalayas and surrounding areas [6]. And the cultural rootedness gives the *H. vulgare* production culture both traditional local production cultural characteristics and modern local production cultural traits. As the soft power of local economic and social development, Tibetan production culture has increasingly shown its important position. Therefore, the study of Tibetan production culture has important theoretical and practical significance.

The *H. vulgare* production culture is the basis for the existence and operation of Tibetan society in China, and the perspectives and historical records of “what”, “where”, “when”, “how” and “why” all have their inherent concerns [7]. How has the *H. vulgare* production culture transformed; what are the influences of the *H. vulgare* production culture transformation; what are the corresponding translation process and actor network of the *H. vulgare* production culture transformation; and what are the similarities and differences between traditional and modern *H. vulgare* production culture. Previous studies of the Tibetan cultural transformation mechanism are based on a single perspective, and lacked in-depth analyses of its transformation and its impacting mechanisms from the perspective of the interaction among different actors. In the present study, actor network theory is employed to study the characteristics, trends, motivations, translation process and cultural transformation of the Tibetan *H. vulgare* production culture. The actor network theory has theoretical and practical significance, which can enrich the research methods and perspectives of Tibetan production culture. Through traditional and modern practices, managers can improve the management awareness of sustainable inheritance and characteristic development of the *H. vulgare* production culture. And it assists the Tibetan *H. vulgare* enterprise decision-makers, operators and practitioners to formulate production culture strategies that are appropriate to the actual development of the *H. vulgare* in Tibet. This study will help the government to formulate a development plan for the *H. vulgare* industry, and that is consistent with the Tibetan rural revitalization strategy and the development of the *H. vulgare* industry chain. Finally, the results are transformed into strategies for the characteristic and innovative development path of the Tibetan *H. vulgare* production culture, and a network of actors that can be used for references, which are provided some suggestions about the Tibetan *H. vulgare* cultural transformation and change.

## 2 The Change of the Tibetan *H. Vulgare* Production Culture

### 2.1 Research Aspects

Due to Tibet's special economic and social development characteristics, Tibetan Buddhism has a deep-rooted influence on production. Consequently, the Tibetan *H. vulgare* production culture has achieved national characteristics and symbolic significance. In contemporary society, the *H. vulgare* is a strongly characteristic economic crop [8], and the industrialized business model “company + base + farmers” has effectively promoted the adjustment of agricultural industry structure [9]. The model has also enabled the Tibetan *H. vulgare* production culture to acquire new content and expressions [10]. Theoretically, the cultural transformation of the *H. vulgare* production in Tibet refers to the changes in the content, structure, mode and style of the cultural system of the *H. vulgare* production. According to the four classifications of culture, culture can be divided into physical culture, institutional culture, behavioral culture and mental culture [11]. On that basis, the transformation of the Tibetan *H. vulgare* production culture can be considered as explicit and implicit changes in the physical state, institution, behavior and mentality. Physical culture includes production methods, production tools, handicrafts; institutional culture includes production systems, production relations and production organization; behavioral culture includes production customs, production exchanges; mental culture includes attitudes towards production technology, attitudes towards economic interests and attitudes towards production organization [12–17].

The Tibetan *H. vulgare* production culture is constantly evolving category of dynamic consciousness, which includes modern *H. vulgare* production culture and traditional *H. vulgare* production cultures [10]. The traditional Tibetan *H. vulgare* production culture is based on primitive belief culture and Bon culture. In terms of physical state, institution, behavior and mentality, the Tibetan *H. vulgare* production culture is dominated by Tibetan Buddhist culture [18, 19].

Modern Tibetan *H. vulgare* production culture has two main origins: “self-innovation” and “modernization”, this is relative to the traditional *H. vulgare* production culture” [20]. Therefore, the modern *H. vulgare* production culture in Tibet is based on industrialized production, and has established a rational cultural model [21]. Given the modern survival model of the traditional *H. vulgare* production culture [22] and the historical sublation and development model of traditional *H. vulgare* production culture [23]. The core scientific question is that how it make the Tibetan *H. vulgare* production culture enters the social field, and how make it stabilizes the social connection, as well as how the culture to transformed. Clearly, it is important to study the transformation of the Tibetan *H. vulgare* production culture between tradition and modernity, as well as the transformation characteristics and trends of the physical culture, behavioral culture, institutional culture and mental culture, which are corresponding to the transformation of the Tibetan *H. vulgare* production culture.

### 2.2 Transformation Mechanism

The cultural transformation of the *H. vulgare* production needs to interpret the social and cultural phenomenon behind the “human-land relationship” through the extension

of “meaning” [24, 25]. The development of cultural phenomena has become an increasing research focus in recent years [26]. In this respect, social mechanism theory [27, 28], external determinism [29] and system theory [30] provide a theoretical basis for studying the cultural transformation mechanism of the *H. vulgare* production in Tibet. Meanwhile, the cultural production research regards culture as a dependent variable and believes that culture should be described or explained by organizational, economic and other “hard” independent variables [31]. The Tibetan *H. vulgare* production culture may show differences between different cultural dimensions and time periods, and such as it has a dynamic nature. Moreover, the cultural transformation of the *H. vulgare* production in Tibet is a complex combination and interaction of all relations, with both direct and indirect effects. Therefore, there may be differences in terms of how the cultural transformation affects the production of the *H. vulgare* in Tibet. This has motivated research examining the complex relationships between the factors influencing the cultural transformation of the *H. vulgare* production in Tibet, from a macroscopic, holistic and dynamic perspective.

Multiple actors, such as the economy, society, policy, religion, ecology, information technology, network, modernization and globalization and its network functions, have been noted to promote dialogue, tolerance, acceptance, integration and inheritance between traditional production culture and modern production culture [32, 33]. In terms of policy, from 1980 to 2020, the central government held seven Tibet work symposiums, and determined the national financial support, special preferential status and counterpart assistance policies, which promoted the adjustment of production relations and internal structure of agriculture in Tibet, as well as it is relate to the changes of the production culture [34]. In terms of social exchanges, Tibetan society has continuously expanded the breadth and depth of the exchanges and integration of various ethnic groups. These exchanges and integration between ethnic groups have promoted the entry of non-Tibetan production culture into Tibetan local production culture, and have continuously promoted the transformation of Tibetan production culture. In addition, internal and external factors such as globalization, modern technology, internet use, stable and open development, demographic characteristics, cross-cultural sensitivity, and situational features [35] can also promote the transformation of production culture in Tibet. These factors are important considerations in research on the cultural transformation mechanism of the *H. vulgare* production in Tibet.

### 2.3 Research Perspective

Some researchers have proposed that the *H. vulgare* culture represents Tibet’s productive forces [6], and explained the connotations of the *H. vulgare* culture<sup>[2]</sup>. These studies provide an important reference for the transformation mechanism of the Tibetan *H. vulgare* production culture. However, these previous studies have focused on a single research perspective. Since the established social “reality” is an interactive product of a series of complex relationships [36], it is necessary to pay attention not only to the reality of differences, but also it is that the factors contribute to it. How do the actors of the difference interpret or understand the difference itself [37]? To answer this question we must explore in detail the interactive relationship between the various actors corresponding

to the cultural transformation of the *H. vulgare* production in Tibet, and its influencing modes.

Since the Tibetan *H. vulgare* production culture has different roles during different stages of social development, it is possible that the influencing factors also vary among different developing stages. To unify the research framework of the cultural transformation of the *H. vulgare* production in Tibet, it is critical to seek a theory that combines the interrelationships among influencing factors and their dynamics. Actor-network theory is a theoretical approach to describe connections [38, 39]. Translation is the connection method of the actor network [40, 41]. In the past, the application of actor network theory in cultural studies [42] was embodied in traditional handicrafts, techniques and styles [43–45], local characteristics [46], humanistic culture and scientific culture [47], public art works [48], cross-cultural theatre performances [49], knowledge production networks [50], and television culture and media practice [36].

## 2.4 Research Methods

Research methods addressing the characteristics, trends and processes of cultural change include content analysis, inductive reasoning, semi-structured interviews [51], qualitative and quantitative analysis techniques (such as text analysis, narrative analysis, case studies, questionnaires, participatory observations), multi-site fieldwork, literature review, NVivo coding analysis, data analysis, multi-class logistic regression analysis, structural equation modeling and statistical analysis [52–54]. The empirical research of scholars shows that the above research methods are mature and reliable, and these methods are effective for research on the cultural transformation of the *H. vulgare* production in Tibet and its influencing modes.

## 3 The Conceptual Model of the Tibetan *H. Vulgare* Production Culture Research

Actor network theory consists of three parts: actors (including human or non-human actors), heterogeneous networks, and translation. Firstly, the research framework of the cultural transformation of the *H. vulgare* production in Tibet is constructed according to the translation process. Next, based on the actor-network theory, the cultural transformation of the *H. vulgare* production in Tibet, the mode of influence, the translation process and the relationship between different counties (districts), different development stages and different dimensions of production culture, actor networks, and the similarities and differences of each aspect are studied. (Fig. 1).

Transformation is the process of establishing linkages between actors through problem presentation, enforcing points of entry, benefiting, enlisting, and mobilizing to align the interests of different actors with those of the main actor. The black box means that the network of actors involved in the cultural transformation of the Tibetan *H. vulgare* production is a dynamic process. Both the entry of new actors and the exit of existing individual actors will prompt the activation of features that have been solidified in the network of previous actors. To ensure that the constructed network is stable, it is necessary to consolidate the consensus reached among the actors involved in the transformation of

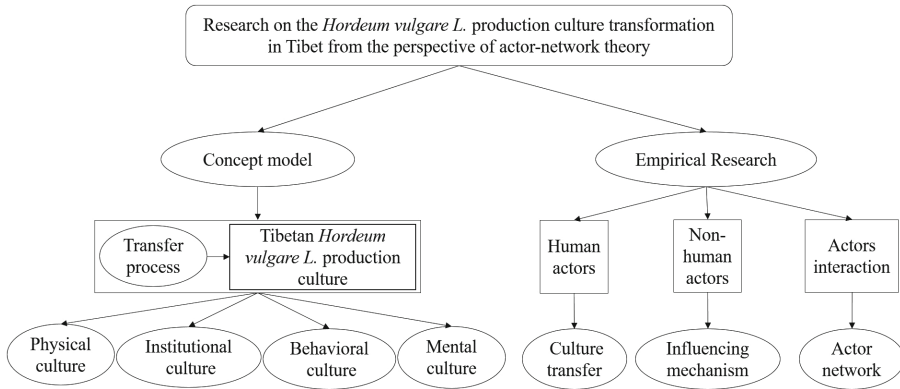


Fig. 1. The research framework

the Tibetan *H. vulgare* production culture into the physical culture, institutional culture, behavioral culture and mental culture. The transformation of the *H. vulgare* production culture is reflected in the physical culture, such as the transformation of production tools, production methods, and production techniques. Transformation of institutional culture is evaluated by the transformation of production systems, production organization, and production relations. Transformation of behavioral culture includes production customs (such as myths, legends, ballads, totem legends, fruit festivals, the *H. vulgare* food culture, the *H. vulgare* wine/beer culture, the *H. vulgare* tea culture, the *H. vulgare* medicine culture) and communication (such as planting, production and processing technology), exchange of experiences, etc. The transformation of mental culture is evaluated by changes in attitude towards production technology, attitude towards economic interests and attitude towards production organization.

#### 4 An Empirical Study of the Tibetan *H. Vulgare* Production Culture

Considering the similarities and differences of the cultural transformation, the *H. vulgare* production in Tibet and its impacting mechanism should study in the four dimensions of culture, such as physical culture, institutional culture, behavioral culture and mental culture. And it should be researched the *H. vulgare* culture change in different stages of economic development. As well as it is also consider its transformation in different regions of Tibet (Fig. 2). On one hand, from the perspective of human actors, studying the Tibetan *H. vulgare* production culture change is about the transformation characteristics, laws and trends. On the other hand, from the perspective of non-human actors, studying the *H. vulgare* production culture in Tibet is about the affecting transformation processes. Lastly, based on the interaction between human actors and non-human actors, constructing and representing the *H. vulgare* production culture transformation in Tibet by the way of the actor network and its heterogeneity.

According to the constructed conceptual model, the research logic of the Tibetan *H. vulgare* production culture is proposed; the transformation characteristics, processes

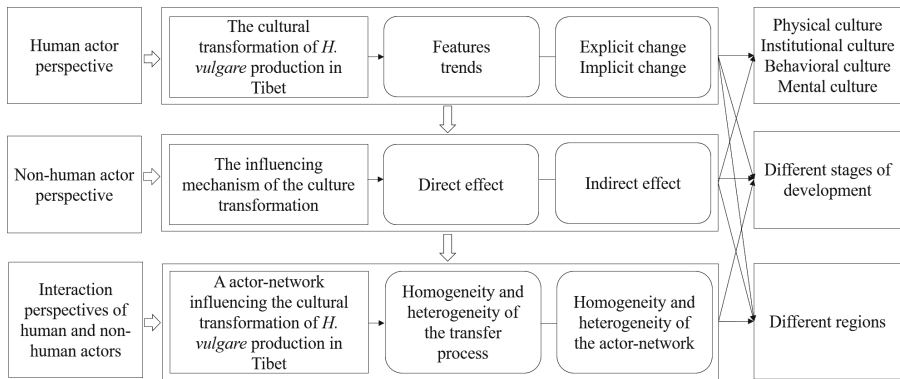


Fig. 2. Empirical research

and trends of the Tibetan *H. vulgare* production culture in the dimensions of physical state, institution, behavior and mentality are studied empirically; and influences on the transformation of the Tibetan *H. vulgare* production culture are evaluated. Based on the empirical research results, this paper explores the transformation process and actor network, and the homogeneity and heterogeneity of the cultural transformation of the *H. vulgare* production in Tibet corresponding to different development stages, different regions (cities), and different counties (districts).

#### 4.1 The Field Research Combined with Comparative Analysis

During field research, the attitudes of Tibetan residents and non-Tibetan residents towards the cultural transformation of the *H. vulgare* production in Tibet are considered separately, with a view to effectively analyzing the cultural transformation of the *H. vulgare* production in Tibet and its underlying processes. Empirical research carries out a comparative study of the cultural transformation mechanism of the *H. vulgare* production in Tibet in terms of different occupations, ages, educational levels, development stages of Tibet, and corresponding regions (cities) and counties (districts). This aspect employs targeted research on the characteristics, transformation laws, development trends, dynamic mechanisms, transformation process and actor network of the Tibetan *H. vulgare* production culture transformation, and evaluates their similarities and differences.

#### 4.2 Qualitative Analysis Combined with Quantitative Analysis

Here we use qualitative analysis methods such as questionnaire surveys, semi-structured interviews, participatory observation, meta-analysis, text analysis, content analysis, data analysis, coefficient of variation weighting, multi-class logistic regression analysis and structured equation modeling, and other quantitative analysis techniques, to study the cultural transformation of the *H. vulgare* production in Tibet. The transformation from the Tibetan traditional *H. vulgare* production culture to the modern *H. vulgare* production culture. And the *H. vulgare* includes both explicit and implicit changes. On one hand,

the explicit change can be measured by questionnaire data, and the cultural change score method can be used to study the dominant change of the Tibetan *H. vulgare* production culture. On the other hand, implicit changes can be perceived but cannot be directly measured. Therefore, multiple qualitative techniques (such as semi-structured interviews, participatory observations, document analysis and content analysis) must be used to explore the implicit transformation of the Tibetan *H. vulgare* production culture.

### 4.3 The Cultural Transformation from the Perspective of Human Actors

Questionnaire surveys are used to obtain data on the cultural transformation of the *H. vulgare* production in Tibet and its impacts. The survey objects include the government, enterprises, scientific and technological workers, Tibetan and non-Tibetan people, and inland residents. Corresponding measurement indicators should be physical culture, institutional culture, behavioral culture and mental culture. This approach should consider the characteristics of the *H. vulgare* production culture in different stages of economic development in Tibet, as well as the differences in the *H. vulgare* production culture in different counties (districts). In addition, semi-structured interviews and participatory observation methods are used to conduct research on some hidden changes in the Tibetan *H. vulgare* production culture, and that cannot be identified with questionnaire data. In theory, the Tibetan *H. vulgare* production culture has transformed a traditional *H. vulgare* production culture into modern *H. vulgare* production culture (Fig. 3). By using variation coefficient weighting, cultural change scoring, narrative analysis path, content analysis and comparative analysis, it is possible to combine quantitative and qualitative analysis methods to explore the characteristics, processes and trends of the Tibetan *H. vulgare* production culture transformation.

### 4.4 The Mechanism from the Perspective of Non-human Actors

From the perspective of non-human actors, we study the economic development, social transformation, policy support, impact of globalization, modernization development, technological progress, individual characteristics (gender, age, education level, occupation, etc.), situational characteristics (such as human development internal response, compliance with traditional culture, behavioral constraints stipulated by Tibetan Buddhist beliefs, the impact of new cultural elements, a sense of national belonging and attitudes towards non-Tibetan local cultural shocks), and finally cross-cultural sensitivity (active awareness of other people's cultures, such as interest, open-mindedness, respect and tolerance for the culture of others). This approach considers how various actors influence the cultural transformation of the *H. vulgare* production in Tibet. Using the questionnaire data, quantitative analysis employed the cultural change score of the *H. vulgare* production in Tibet as the dependent variable and the factors representing the internal and external dynamics as the independent variables. First, the direct effects of cultural transformation of the *H. vulgare* production in Tibet were studied using multi-class logistic regression analysis. Then, the mediating effects of the cultural transformation of the *H. vulgare* production in Tibet were studied using a structural equation model. We used comparative analysis method to study the similarities and differences of the *H. vulgare* production culture in terms of the physical state, institution, behavior



and mentality and cultural dimensions, the different development stages of Tibet's economy, and the transformation mechanisms corresponding to different regions (cities) and counties (districts) in Tibet.

#### 4.5 Network Actors of the Tibetan *H. Vulgare* Production Cultural Transformation

The cultural transformation of the *H. vulgare* production in Tibet, and its influences, may exist in different dimensions of the *H. vulgare* production culture, in different stages of economic development in Tibet, and in different counties (districts). According to the research results on the characteristics and influence of the cultural transformation of the *H. vulgare* production in Tibet, we can use additional analysis (text, content, literature, NVivo coding, and data) to study the translation process and its similarities and differences of the *H. vulgare* in Tibet. The characteristics and trends about the cultural transformation of the *H. vulgare* production in Tibet vary between different cultural dimensions, different stages of economic development, and the actual development of the *H. vulgare* industry in different regions (cities) and counties (districts) in Tibet. Therefore, it is necessary to analyze the actors, control access points, the problems faced by each actor, and the goals of each actor to construct the actor network of the Tibetan *H. vulgare* production culture when analyzing the similarities and differences of the actor network.

## 5 Discussions

In the specific empirical research applied here, both qualitative and quantitative analysis methods are needed to study the cultural transformation of the *H. vulgare* production in Tibet, and its impacts. First, one approach is to study the transformation from the traditional Tibetan *H. vulgare* production culture to the modern Tibetan *H. vulgare* production culture. And the production culture is including the explicit and implicit cultural changes of the *H. vulgare*. Second, the direct effect of the cultural transformation. The mediating effect of the cultural transformation of the *H. vulgare* production in Tibet, can be assessed using structural equation modeling. Third, the transformation characteristics, laws and trends of the Tibetan *H. vulgare* production culture can be studied from the perspectives of human and non-human actors, as well as their interactions. This paper constructs the actor network and assesses its heterogeneity in the cultural transformation of the *H. vulgare* production in Tibet.

Actor network theory has theoretical and practical benefits when studying the cultural transformation mechanism of the *H. vulgare* production in Tibet. The network of corresponding actors the *H. vulgare* is a dynamic process, and includes the actors of the *H. vulgare* production culture associated with physical culture, institutional culture, behavioral culture and mental culture. Meanwhile, based on actor network theory, this review studies the cultural transformation, influence, translation process and actor network of the Tibetan *H. vulgare* production in different regions and different developing stages.

It is of both theoretical and practical significance to study the characteristics, trends, motivations, transition process and actor network of the Tibetan *H. vulgare* production culture based on actor network theory. This knowledge can enrich the research methods and perspectives of Tibetan production culture. Exploring the modern development paths related to the production process of the *H. vulgare*, such as the *H. vulgare* planting and processing, has the aim of further developing modern *H. vulgare* industrial systems. Meanwhile, the governance system of the modern actor network is constructed to effectively undertake improvement of the strength of the Tibetan *H. vulgare* production culture. Meanwhile, it is to provide some suggestions for the development and transformation of the Tibetan *H. vulgare* production culture during the “14th Five-Year Plan” period.

## 6 Conclusions

Cultural transformation of the *H. vulgare* production in Tibet exists objectively. The transformation of the *H. vulgare* production culture in Tibet can be considered as explicit and implicit changes in physical culture, institutional culture, behavioral culture and mental culture. From the perspective of human actors, this paper studies the features, laws and trends of the cultural transformation of the traditional Tibetan *H. vulgare* production.

There may be differences in how the cultural transformation process affects the production of the *H. vulgare* in Tibet. From the perspective of non-human actors, this paper studies the direct and mediating effects of the *H. vulgare* production cultural transformation in Tibet, and emphasizes that the cultural transformation of the *H. vulgare*, and that is the result about the combined effects of external and internal dynamics. To unify the research framework of the cultural transformation of the *H. vulgare* production in Tibet, it is critical to seek a theory that combines the interrelationships among influencing factors and their actor network dynamics. This should be considered from macro, overall and dynamic perspectives when examining the complex relationship among the influencing factors about the cultural transformation of the *H. vulgare* production in Tibet.

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