Climate change effects and the responses of the agri-food GI agents: Evidence from the Veneto Region (Italy)

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***Abstract* – Climate change is changing environmental conditions of some terroirs on which geographical indications (GIs) rely. Based on the case study of the Veneto Region in Italy, this research aims to understand whether these effects are common to different types of agri-food GIs and how GI agents are responding to climate change effects. The research adopts a mixed-method approach, based on 14 semi-structured in-depth interviews with key informants and online survey. The results draw on different levels of concerns and responses to climate change, which vary in relation to the type of GI and crop systems.**

***Keywords* – geographical indications, agri-food systems, climate change responses, Veneto.**

Introduction

Geographical indications (GIs) are important livelihood for millions of smallholder farmers and rural communities across the world (FAO, 2018). However, there is alarming evidence that climate change (CC) is altering some of the fundamental characteristics of local *terroirs* on which GI systems rely, hence affecting productivity and profitability of farms (Clark and Kerr, 2017). GI producers might suffer from the stringent regulations that can limit the adoption of new strategies to cope with CC hazards. This situation raises unprecedented questions for both producers and for GIs managing authorities: *Are these effects common to different types of agri-food GIs? And how GI agents are responding to CC effects?*

Despite an abundance of studies addressing the local adaptation strategies within agri-food sector (e.g., Ahmed et al., 2021), little attention is paid to GI systems. Such studies focus mainly on wine GIs. Using a mixed-method approach, this study aims to provide evidence of the responses of the agri-food GIs agents to CC effects in the Veneto region.

Methods and Data

Case study. The Veneto region in Northern Italy hosts a large portion and variety of the Italian agri-food GIs, both in terms of number of certifications (36 GIs in total) and in terms of product types (i.e., cereals, fruits and vegetables, meat and cheeses).

Data collection. A mixed-method approach is adopted, based on 14 semi-structured in-depth interviews with key informants and online survey involving 77 producers. For interviews, a subsample of 11 agri-food GIs was used, including 3 animal-based Protected Denominations of Origin (PDOs), 3 crop-based PDOs, and 5 crop-based Protected Geographical Indications (PGIs) (Table 1). The subsample is representative of the large heterogeneity of agri-food GIs in Veneto, according to some key features such as GI type, revenue, registration year, and share of production in Veneto (Salpina and Pagliacci, 2021).

Table 1. Subsample of GIs (semi-structured interviews)

GI (short names)	Scheme [a]	N. oper [b]	Prod area ha [b]	Prod. cycle [c]	Type [d]
Asparago B.	PDO	56	14	03-06	AC
Ciliegia M.	PGI	121	58	03-08	PC
Fagiolo L.	PGI	81	12	05-09	AC
Monte Veronese	PDO	140	3093	All yr.	AB
Radicchio Ch.	PGI	32	97	12-07	AC
Radicchio T.	PGI	114	303	06-12	AC
Riso N.V.V.	PGI	28	524	04-10	AC
Olio Veneto	PDO	290	371	03-01	PC
Casatella T.	PDO	70	1427	All yr.	AB
Piave	PDO	180	NA	All.yr.	AB
Marrone S.Z.	PDO	29	52	03-11	PC

[a]Mipaaf; [b]Qualigeo (Qualivita) data; [c]data from Production Specifications (PS); [d]AC-annual crop, PC-permanent crop, AB-anima-based.

The interviews were conducted both face-to-face and remotely, and lasted around 25-40 min. Key informants, including Consortia (i.e., GI managing authorities) and producers' organisations (POs) were selected based on purposive sampling.

For online survey, all agri-food GIs produced in the region were considered. The survey was sent only to producers, whose contacts were provided by Consortia or available in online databases. The survey – which was elaborated using LimeSurvey platform – included multiple choice and 5-point Likert scale questions.

Data analysis. All interviews were transcribed *verbatim* and coded via RQDA – an open-source computer-assisted qualitative data analysis (CAQDAS)-based R Extension (Huang, 2016). A hybrid process of inductive and deductive thematic analysis was adopted (Fereday and Muir-Cochrane, 2006). The observations of key informants on effects and responses

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to CC were grouped into broader categories and used in online survey targeted to producers within a larger sample of GIs. The survey responses were analysed aggregately.

Results and Discussion

Key informants reported multiplicity of observations, which are both directly (e.g., decreased precipitations) and indirectly related to CC (e.g., new plant diseases). These observations were merged into 8 general groups (Fig. 1).

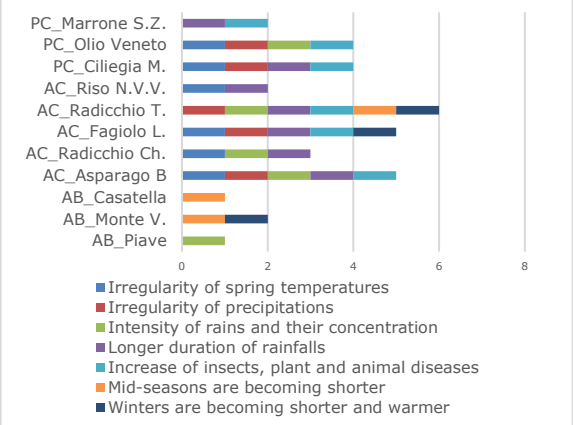

Figure 1. CC observations reported by GI key informants

Greater intensity and duration of rainfalls are common CC observations among all types of GIs. However, the largest variety of CC observations were reported by crop-based GIs.

The main CC effects perceived by key informants were assessed by a larger sample of GI producers (Fig. 2). They reported the largest concern for the quantitative and qualitative reduction of productions.

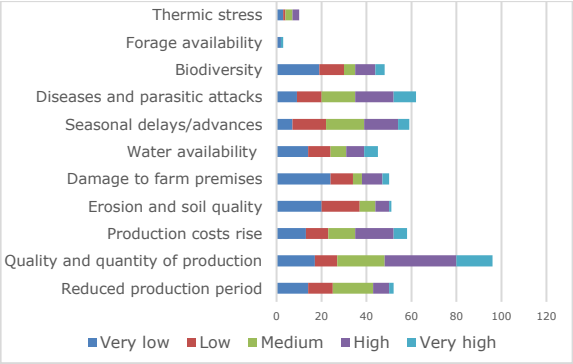

Figure 1. CC effects evaluated by producers of GIs

In terms of responses to CC, 74% of survey respondents have already adapted or are planning to adapt to CC effects, mostly relying on private (55%) and public funds (39%). As compared to animal-based GIs, agents of crop-based GIs reported a larger amount and diversity of responses to CC (e.g., use protective covers, new irrigation systems, change of production processes), which is in line with previous study by Bradley et al. (2020) attesting that CC risk perception enhances the levels of CC response.

Overall, at farm level, the responses of GI agents to CC effects might be not so different from producers of non-GI crops (Bonzanigo et al., 2015). However, the main peculiarity of GIs relies on the responses at the GI system level. Thus, among all types of GIs, Consortia have already introduced some modifications to product specifications directly referred to CC effects, such as the temporary extension of forage production area, introduction of new plant varieties, and shift of harvesting period. Also, few anticipatory methods were highlighted by Consortia and POs, including the provision of advisory support to farmers based on phenological stages of crops and data from ad-hoc meteorological stations.

Concluding Remarks

The essence of this study was to provide evidence of the responses of the agri-food GIs agents to CC effects in the Veneto region. The results showed different levels of concern and responses to CC, which vary in relation to the type of GI (animal-based/crop-based) and crop systems (annual/permanent crops). The results can be used by decision-makers in drafting the regional adaptation strategies.

The survey gave important insights on the responses of GI agents to CC effects. However, future studies will consider a larger sample of GI agents to guarantee statistical significance of the survey.

Acknowledgement

The authors would like to thank all agri-food GI agents that participated in this study.

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