



Updating Natureculture Practices in Abruzzo: towards the Prototyping of New Ecological Relationships between Sheperds, Farmers, Animals and Plants

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ABSTRACT

This paper is about an ethnographic journey into traditional agropastoral practices in the region of central Italy called Abruzzo, which brought the researcher close to human and non humans inhabitants and their natureculture entanglements, and informed a participatory design process on how to nurture socio-ecological relationships in order to support local biodiversity. Two ethnographic accounts relating to the new rural generation are unfolded, showing how traditional agropastoral practices have been taken up by young farmers and shepherds, as well as the challenges and opportunities that arise. The paper suggests two different ideas of updating natureculture practices: one leading to the creation of a co-existence relationship among the shepherd, the sheep and the newts, all revolving around the drinking trough as a *common*; one leading to the (re)activation of people care for wild plants as potential *crop wild relatives* (CWR), a source of genetic resources for food and agriculture.

CCS CONCEPTS

• **Human-centered computing** → *Empirical studies in interaction design*.

KEYWORDS

Biodiversity; Participatory design; Human - more than human relationships; Crop Wild Relatives; Farmers; Shepherds; Abruzzo

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1 INTRODUCTION

This paper is about an ethnographic journey into traditional agropastoral practices in the region of central Italy called Abruzzo, which brought the researcher close to human and non humans

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inhabitants and their natureculture entanglements, and informed a participatory design process on how to nurture socio-ecological relationships in order to support local biodiversity.

Abruzzo region is mainly covered by the Italian Apennines mountains on the west, which includes the highest massifs of the Apennines, such as the Gran Sasso d'Italia and the Maiella, and a coastal area on the east with beaches on the Adriatic Sea. It is the European region with the highest percentage of protected area, equal to 30%, as three national parks and several regional and local reserves are located in its territory. Within the protected areas, there are not only natural environment, such as forests, primary grasslands, rock walls, but also anthropic ecosystems, such as pastures and cultivated plots [30].

The impervious vast area of the mountains has historically caused the fragmentation and isolation of the population, which has lived in scattered villages, perched on the slopes or nestled in the valleys, until the very recent infrastructure works of the second half of the 1900s, which provided the territory with highways and tunnels to cross the mountains. The livelihood of the inhabitants of the Abruzzo mountainous villages have always been based on agriculture and livestock husbandry (mainly sheeps), which can be dated back since prehistory. The alternation on higher altitudes of agriculture and herding over the centuries has been paced by different factors [33] :

- Sheep-rearing crisis. Besides animals plagues which were registered several times over centuries, the sheep-rearing crisis was particularly relevant at the beginning of 1800 ca., when feudalism was banned, higher altitude pastures became suddenly available to new, smaller settlers and the seasonal movements of flocks (transhumance) to the plain areas of Puglia began its arrest (see subsection 1.1);
- Climate conditions. The small glaciation made agriculture impossible to higher altitudes almost for three centuries (from the second half of 1500 to the second half of 1800) ;
- Demographic changes. Human (and animals) plagues and famines hit in Abruzzo as all over Europe through the centuries. On the other hand, on peaks of demographic increment, people were forced to look for new lands to cultivate for the family livelihood.

1.1 Pastoralism practices in Abruzzo mountains

In Abruzzo two different forms of livestock movements could be distinguished, which mainly refers to sheeps : i) transhumance and ii) montication (in Italian "monticazione"). Transhumance refers to horizontally moving a very huge flock from the mountains to lower

plains at the beginning of the autumn when temperature drops, and back to the mountains at the end of spring, which has been practiced since before the Ancient Romans. It had his bigger phase in the XVI - XVII century, moving up to 4 millions of sheep to the southern plains of Puglia region. With the end of feudalism starting from 1800, the transhumance has a big arrest and shepherds had to target other grazing areas, such as the countryside of Rome or the same coastal zones of Abruzzo. This shaped transhumance practice through times up to becoming "vertical transhumance", which still persists nowadays and consists of the seasonal going up and down from the Abruzzo mountains towards the coastal areas of the same region (to be clear, not reaching Puglia anymore). Sheep and sheperds usually walk, but in some particular cases, trucks can be used to move the animals, such as when sheep are pregnant or new born lambs couldn't make such a long travel [37]. "Monticazione" instead refers to non transhumance pastoralism. Specific economic and sociocultural characteristic differentiates it from transhumance. First of all, montication has been a common practice of small-medium flocks owners and their families who inhabited Abruzzo mountain vilages and used to breed animals for the family livelihood. It has been especially practiced in the territory of the Majella massif and still remains, although practised by very few shepherds. Montication seasonal movement of sheep follows the growth of spring herbs and involves moving the flock to the higher pastures on the nearby mountains during the end of spring and throughout the summer, and to bring them back to the family stall at the first cold of autumn. When the walking distance allowed it, the sheperds used to go up and come back home for the night, leaving their flock unattended inside a natural cave whose entrance was protected by dry stones walls and branches [31]. When instead bigger distances and higher altitudes prevented shepherds to come back home at night, they also stayed and lived for 2/3 months in the cave, together with their animals. The caves were equipped with basic utensils, a sort of fireplace and a sleeping zone [33] [34]. In order to ensure a convenient and sustainable management and seasonal montication of the herds, different small owners used to practise the "morra" [42], which consists of gathering several small flocks of sheep and goats belonging to different people into a bigger flock (the "morra") managed by a single shepherd or a team of them working on shifts to carry out the several activities involved with breeding (grazing; milking; producing cheese; protecting the animals at night; etc). A "morra" is formed when a suitable number of sheep is reached, however there is no agreement on the right number of sheep to compose a "morra", which could range from 200 to 350 animals [Fig.1].

This depends on a series of environmental, social and livestock factors, such as the topography/accessibility of the grazing plots; the kinships and relationships among the shepherds; the kind of animals to be moved and their reproductive period. This practice has allowed the maintenance of a diffused small pastoralism in the territory, especially in the Maiella massif, which has provided the livelihood to many generations through the years and the molding of a peculiar agropastoral landscape.

1.2 Agriculture practices in Abruzzo mountains

In the specific territory of Majella massif, a characteristic agriculture practice has been the stones removal, also known as *spietramenti*



Figure 1: Shepherd Domenico De Angelis with his "morra" on Majella pastures, 1986. [Courtesy of Angiolina De Angelis]

which are cumulus of stone which have been removed manually from the ground in order to make it suitable for cultivation [Fig.2].



Figure 2: Stacks of removed stones, so called "spietramenti", on Majella massif, as they appear nowadays.

The removal and stacking of stones on higher altitudes was mainly carried out from 1800 until 1950 by less privileged farmers for the following reasons: the end of feudalism; the sheep breeding crisis and demographic increment. All those factors caused that people settled on difficult mountainous areas at 1400-1700m of altitude in order to cultivate small plots and have just enough pasture for the family livestock during the warmer season. To make the soil arable, they had to remove the embedded stones and make terracing. With the removed stones, they used to build little dry stones shelter, the *capanne*, which could be used by the single farmer during the warmer season [Fig.3].

In some cases, the shelter could be bigger or a cluster of them to accommodate the seasonal movement of the entire family to the



Figure 3: A dry stones shelter ("capanna") built by a farmer from the "spietramenti" stones, as it appear nowadays. [Courtesy of Angiolina De Angelis]

mountainous plot, with stones walls to enclose the areas for the livestock in tow [33].

2 RECOGNIZING NATURECULTURE IN ABRUZZO

The rooted and long lasting agriculture and livestock husbandry in Abruzzo has fostered a reciprocal molding of the natural environment and the local culture. Citing Catsadorakis [9]: "A certain culture and technology acted along with natural factors...to create certain kinds of landscapes and certain kinds and levels of biodiversity". The results are both tangible, in the agropastoral landscape and the emerged ecosystems, and intangible, in the culture and in the worldview of the local communities, constituting what we could indicate as the *natureculture* of Abruzzo. Following Donna Haraway definition [25], natureculture is a concept that points to the syntheses of nature and culture, blurring the borders that have been established among the two by the colonialist western way of thinking non-human and human as the opposite sides of a dichotomy. Natureculture recognizes the entanglements of nature/culture, human/animal in ecological relationships that are both biophysical and socially formed [29]. It reframes our worldview so that human, non-humans and the environment are bound together through deep relationships which enable processes of *becoming-with*. Traditional transhumance and montication in Abruzzo has developed plenty of naturecultural patterns as they have been shaping relations among people, animals and ecosystems. As an example, shepherds, sheep and shepherd dogs' life have been tightly entangled through the seasonal movement of livestock from one grazing ground to the another one, during which the humans and the animals lived literally together for long periods. More than an utilitarian bond, they embody a particular co-constitutive relationship, which they both shape and are shaped by [26]. Borrowing Haraway's terminology, sheeps, shepherds and shepherd dogs of Abruzzo are reciprocal

companion species for each other. The practice of the "morra" constitutes as well an example of natureculture. It involves at the same time a social, cultural and livestock organization. Participating to a "morra" meant for the shepherds to weave, strenghten and be woven into particular relationships of trust, responsibility, solidarity and collaboration with their peers, as well as to care for the animals and for the environment towards a sustainable use of the pastures. The stones removal, "spietramenti", also represents a natureculture practice as the human action to transform the cultivability of the soil for human livelihood deeply changed the mountainous landscape with dry stone stacks and shelters, as well as it created semi-natural anthropogenic ecosystems which are characterized by great biodiversity of plant and animal life. The many species of orchids and flowers growing on the pastures [35], the presence of several wild crop relatives [3] as well as of specific amphibians, reptiles and birds [30] [19] are all examples of the biodiversity richness of such territories which has positively been influenced and shaped by the presence of farmers and shepherds over centuries. Following the second world war, the Abruzzo mountainous territory has been experiencing a significant rural shrinking and a depopulation phenomenon due to internal and international migration, whose causes are not going to be uncovered here because it is beyond the aims of this paper [6]. As Micati describes [32], mountainous cultivations were suddenly dismissed, resulting in a progressive rewilding of the abandoned agropastoral landscape [Fig.4] and loss of the co-evolved ecological past [1].



Figure 4: The fold in the background is located on the Majella massif. It has been dismissed for years and progressively it has been surrounded by bushes and brambles. Recently, two young shepherds, Angiolina and Marina De Angelis, took it back and restarted to use it.

Since 2000, pasture areas like those in Abruzzo have been included by the European Commission in the Natura 2000 network of threatened habitat, esplicitally indicating that the abandonment of extensive farming practices and the lack of grazing and pastoralism are among the main threats to such habitats [13]. Member states are required to work towards Natura 2000 sites' conservation and sustainable management, both ecologically and economically [14]. For instance, in Abruzzo, the National Park of Majella [20] and

the National Park of Gran Sasso and Laga Mountains [18], both comprehending such Natura 2000 semi-natural grassland habitat, have created a management plan whose objectives aim at the promotion of traditional grazing practices and extensive agriculture in their territories [19] [17]. Recently the National Park of Majella also started to monitor how the spontaneous rewildening of abandoned cultivation plots and pastures may affect the rich biodiversity which is specific of those semi-natural landscapes [35]. The parks have undertaken several actions to try to reverse the abandon of mountainous areas and its negative effects on biodiversity, for instance: the creation of a network of custodian farmers to reactivate traditional farming practices within the local community [41]; the establishment of botanical gardens and a seed bank for in-situ and ex-situ conservation of plants biodiversity [21]; the restoration of few traditional dry stone shelters, the promotion of trekking routes through them and the teaching of such building technique to locals in order to foster voluntary restoration activities.

On the other hand, in the last couple of decades, a return to the Abruzzo mountains and its agropastoral activities has been registered among younger adults (20s-40s). As uncovered during the fieldwork of this research, the actual younger farmers and shepherds generation often upholds their agropastoral activity from their grandparents, as their parents instead have discontinued the tradition. Among new farmers, some come directly from agronomy academic education. In the following section, we will focus on two ethnographic accounts which have been collected during the fieldwork in Abruzzo.

3 FIELDWORK

In an attempt to retrace natureculture practices in contemporary Abruzzo, a fieldwork has been conducted with new generation of farmers and shepherds from October '22 to February '23. Four participants were selected (two shepherds and two farmers) within the protected territory of the Majella National Park and of the Gran Sasso and Monti della Laga Park. Each participant was invited to an initial semi-structured interview - in presence or online -lasting up to 2 hours with the researcher. It was meant to investigate the motivations that led each of them to become farmer or shepherd in contemporary Abruzzo, as well as to focus on the specific agropastoral practices taken up by each participant. To follow, the researcher agreed with the participants to visit them again and shadow them while performing farming or livestock husbandry activities. Interviews and shadowing was documented through notes, pictures and videos. As a research task to be carried out independently without the researcher presence, participants received a specific assignment which invited them to "noticing" nature and the entanglements between natural elements and their farming and livestock activities. Noticing is a concept introduced by anthropologist Anna Tsing which refers to the attitude to sense, pay attention and understand the environment and its relationships over time [43]. As pointed by Rosén et al, noticing recognizes the interconnectedness of ecological, economical, and cultural systems – and how these systems function from the perspective of multiple species [40]. Participants were required to take pictures to show such entanglements, write little descriptions and send both via Whatsapp to the researcher. They started working on the assignment soon after their interview,

until the end of January. During that period, the researcher and the participants kept an open communication channel through phone calls and Whatsapp chat, which allowed the researcher to make additional questions and resolve doubts when needed. As shown in the table below (Fig.5), after the initial interviews that engaged all the four persons, the following research phases were conducted in a flexible way, allowing participants to join or not the activities at their own pace, based on their interest and available time. In the following sections, two specific ethnographic accounts are reported, which informed the design interventions.

	P1/ Shepherd	P2/ Shepherd	P3/ Farmer	P4/ Farmer
Interview	●	●	●	●
Noticing exercise	●	●	●	
Visit	●		*remote ●	●
Shadowing	●			●

Figure 5: Participants joining the research activities.

3.1 Catching up with family herding tradition

Shepherd Angiolina, 38yo, resumed her family herding practice in 2018 in the village of Caramanico Terme, together with her sister Marina, after 10 years of discontinuation during which both had another job [Fig.6]. She has nurtured the idea of becoming a shepherd as her older relatives for years, pushed by a nostalgia feeling for that kind of life. Anyway, as she couldn't make it alone, she waited for Marina to join her dream and they together started the activity.



Figure 6: Angiolina and Marina's winter stable, where sheep and a few goats live during the snowy season until the next montication at spring.

As far as Angiolina knows, her great-grandfather was already a shepherd, as well as her grandfather Domenico, who used to walk the local "morra" on montication, and her father Antonio [Fig.7], until he passed in 1996. Her mother took over until 2008, when she decided to sell the herd because it was too hard to manage by herself without any other people working with her. Nowadays, Angiolina and Marina manage a flock of about 250 sheep, from which they produce cheese and meat to sell to the local market.

Angiolina follows the tradition of montication and annually rents two pastures at two different altitudes: the lower pasture from the municipality and the higher one from the Italian State Forestry Guard. She reports that when she restarted montication in 2008 with her sister, they had to clean and restore the sheepfold at the lower altitude which has been completely absorbed by meadows and brambles: *"Before us, there was no one left working on these lands....the shepherd's profession has almost been lost here. We worked so much during the first years, restoring the troughs, removing all the bushes and brambles outside and inside the fold. You could even find the way to the fold gate!"* While talking about the great work they had done to resume the pastoralism practice on the mountainous pastures in 2018, Marina realised that bringing back the animals on the mountains, which implied i) reshaping natural elements and ii) restoring the human artifacts so that both could host pastoralism back, benefited the environment as well, even if such environment- she doubts - could not really be considered as a purely natural one because it is greatly influenced by the presence of farmers/shepherds and their activities. Marina's reflection is key to understand the current, shared condition among local shepherds of feeling deligitimated to inhabit and graze on the mountains with their sheep, which arises from a perceived tension between the objectives of ecological conservation and the practice of agropastoral activities on the protected areas. Even if there is an established day by the local authority that shepherds should stick to to start montication at spring, she describes having her own practice to attune herself to the sprouting of the first grass: *"After snow has melted, I have a walk to the mountains and I do a first survey of the grasslands to see when it's time to bring the flock out from the winter stable and walk it to the first sheepfold. Every year it changes actually..."* For the first period of montication, Angiolina and her sheep reach just the first sheepfold. Only when new grass has sprouted on higher altitudes and temperature raises, she moves her flock to the second fold. She is very conscious of the way she tends both her sheep and the grasslands, as she rotates the pastures: *"During the montication period, the sheep are always grazing on different grass and I take care not to overuse the lands. Rotating the pastures allows the grass to resprout, so that the sheep always feed on the best herbs. This is good for the land, which is always able to rest, and also good for the cheese I produce, because according to the herbs the animals eat, the cheese will have particular flavors..."* While driving the researcher through the mountainous pastures and describing the territory around, Angiolina expressed her great sense of gratitude towards her ancestors for shaping the environment as it is now and recognizes how humans and natural elements are deeply entangled on the pastoral mountains: *"Everything here has been created by people together with nature. The trough [my grandfather built] is part of the nature, I do believe it! This is something that I just know because I "live" it. Academic studies, as I see it, are unfortunately not*

providing this knowledge, I am afraid... The practice on the mountains and my ancestors gave me this knowledge." She also highlighted how ancestors has nurtured a relationships of reciprocity with natural elements and passed this attitude to the new generations: *"For the ancestors, every action they performed in the natural environment corresponded to a plan for the future. This is the foundation why humans have not exploited this territory over centuries, because they cared for it for the sake of human wellbeing. My grandmother knows how much wood she could take from the forest without harming it. She also uses to pick the gentian (which is now forbidden!), but just as much as to preserve it for the future. She, as well as the other people of this land, uses to care for wild trees in the forest, pruning the bent branches or even watering them on dry summer."* The story of Angiolina outlines an approach of "deep care" towards the landscape [36], also referred to as landscape stewardship [4]. As Conrad describes, stewardship approach implies that people manage their landscapes and the resources contained therein not only assuming that they have rights (typical of owners) but also on a realisation that they have corresponding duties (typical of caretakers) [15]. Within the approach of landscapes stewardship, reciprocity principle guides relationships among humans, non humans and the environment and sustainability is achieved through a resulting twine of actions of care. Angiolina's ethnography foregrounds a worldview which considers nature not as a resource, but as a common, to use the words of De la Bellacasa and Papadopoulos [16], a shared resource by human and more than humans which needs to be managed well and not to be exploited.

Another episode Angiolina shared shows instead a particular tension that may arise about human-non humans co-existence on the mountains. She reported of a day when she was working hard to clean a drinking trough from the much vegetation grown in the water that made the water green and "dirty" for the sheep to drink, when she was admonished by the forest rangers, as they explained her that she could have potentially hurt newts reproduction [Fig.8]. *"I didn't know about newts at all and it was completely not my intention to potentially harm them...Until today, you know, I have never seen any newt, I do not know how they look like..."* Newts are a species of amphibians which is of European Community interest in need of strict protection, according to the Habitat Directive and Natura 2000 initiative [12] [11]. Member States are therefore required to take measures to ensure newts are protected and monitored, their habitat not destroyed neither deteriorated, as well as to support their coexistence with human activities. Complying to the Directive provisions, a regulation is issued [19], which however Angiolina was completely not informed about. Regardless the regulation, what is particularly interesting is that until that day shepherd Angiolina was ignoring the fact that she and her sheep were sharing the trough with other beings and that they could have unintentionally harm them. This story reveals us that the re-activation of traditional agropastoral activities in the actual context may present novel challenges and hidden risks to unintentionally fail in reciprocal care among shepherds and the more than humans, due to the modified environmental and anthropic conditions, the different current approach to environmental conservation, the knowledge gap between the growing scientific knowledge and the discontinued indigenous local knowledge.



Figure 7: Sheperds use to engrave stones with their names while the sheeps were grazing. In this picture, starting from the left, engravings from the brother of Angiolina's great grandfather Salvatore, the grandfather Domenico, and her father Antonio. [Courtesy of Edoardo Micati]

3.2 Reconnecting to family ties through the care of wild plants

The second ethnographic account belongs to farmer Carla Di Michele, 24 yo. Carla has an academic degree in agricultural sciences and technologies and after completing her studies she started her farm in the village of Cepagatti in 2017, where she cultivates vegetables, fruits and also transform them into products. Her boyfriend and her family joined her and work in her farm. Since she was a child, Carla has always imagined her life in the Abruzzo fields as a farmer. Neither her parents nor her grandparents are professional farmers, but she reports that every family in her territory has always used to have its own small vegetable garden and to cultivate it in the traditional ways, just to supplies the family livelyhood. In 2007 her family initially bought some land for horse breeding, later it also hosted Carla's farm [Fig.9]. *"From my childhood I still remember the smell of the wet grass, after raining, when walking to primary school. I cannot imagine myself away from this territory because I cannot live without this kind of experiences!"*, Carla reported.

She has many memories connected to her grandmother farming practices and traditions and nowadays she produces many products using traditional recipes from her grandmother or even from her great grandmother ("romanella" tomato source; "scrucchiata d' Abruzzo", a kind of grapes compote; "mele cotogne"- quince - jam). from the grandmother recipe, which is the traditional one from Abruzzo. She claims: *"With the products of my farm, I want to bring traditions back, contributing with the needed update. Traditions are being lost..."* and she continues : *"I have recently planted 10 "mele cotogne" trees [quince plants]. Before, you used to find them in the wild, and you could pick those wild apples when you needed. Now, there are none...because people have not been caring for those trees anymore. Why did they dismiss that care? Because people nowadays have no time to cook those apples (those apple need to be cooked, they are very hard to bite otherwise), so nobody is eating them anymore neither caring those trees, such removing the brambles around, etc. and trees are being absorbed by the forest and dying."* Deepening on this phenomenon of increase abandon of wild trees, Carla describes a personal : *"My grandmother planted several fruit trees, among which a "melelle" tree, at the edge of her olive tree grove. "Melelle" are very juicy, lemon-flavoured, tiny apples, with the drawback of*

having a big core. They are the ancestor of the apples we eat today, to be clear. Recently, remembering my grandmother shouting during the olive harvest "Let's go and pick the melelle!", I wanted to find that tree and I managed! I cleaned the tree, I removed all the brambles. I did it because it reminds me of my grandmother and our tradition of eating those apples. As a child I was really looking forward to eat them, when I was thirsty. There is also something about the gesture of picking an apple from the wild tree... I want to keep the tradition of harvesting olives and eating those apples, so I cleaned the tree as soon as my grandmother lent me her land. And when I bring my team to harvest olives, the first thing I say to them is to pick and eat a melella! She also is very precise in describing the flavours she has memories of. She said that those apples have a taste that she could never forget. When she buy apples, they are nothing compared to the "melelle" and she explained that such flavours and taste are given to those fruits by the climate of the particular territory where they grow. As a drawback of such a variety of apple, there is that the tree produces very little quantity, thus it is not encouraging people to harvest t After collecting Carla's story, the researcher tried to assess if the tradition of "caring wild plants" was shared among other people in Abruzzo interviewed during the fieldwork. Indeed, until just under a generation ago it seems quite common that people remember being child and picking wild fruits or that grandparents brought back small pears, prunes or similar from the forest or wild areas at the edges of their vegetable gardens to complement their diet or to share with other family members "just for tradition". However, it is a practice that people reported to be lost for many different reasons, among which the progressive abandon of rural life, villages and agropastoral traditions; the prevalence of intensive agriculture at a national level and the genetic selection of crops for mass production which make veggies and fruits available in the big distribution. Besides that, the researcher consulted ecologist and farming experts to specifically value such tradition in terms of biodiversity conservation. It resulted that caring wild plants may significantly contribute to the local agrobiodiversity, because the wild trees people have been caring, foraging from, building traditions around, included in natureculture practices, could easily be so-called "crop wild relatives" (CWR). Citing FAO and Biodiversity International [27], crop wild relatives are wild plant species that are genetically



Figure 8: Angiolina took this picture after cleaning the trough and just before the forest guard came to admonish her. [Courtesy of Angiolina De Angelis]

related to cultivated crops. They are untended by humans and they continue to evolve in the wild, developing traits – such as drought tolerance or pest resistance – that farmers and breeders can cross with domesticated crops to produce new varieties. They have been used to improve the yields and nutritional quality of crops since the beginnings of agriculture. For example, by planting them alongside domesticated crops, farmers have been promoting natural crossing of beneficial traits. Nowadays, wild plants play an extremely important role as "plant genetic resources for food and agriculture" (PGRFA) in the wild [23] since their genes have also provided cultivars with resistance against pests and diseases and improved



Figure 9: Carla in her cabbage field. [Courtesy of Carla Di Michele]

tolerance to abiotic stresses (drought, salinity, extreme climate conditions/climate changes). Initiatives aimed at preserving the genetic diversity of indigenous plants in Abruzzo have been introduced, including a seeds bank of both wild and cultivated species and the creation of a network of "custodian farmers" [10], but no actions have been conceived that address single indigenous plants that grow in the wild and used to be maintained through the culturally rooted practises of local communities foraging/caring.

4 DESIGN INTERVENTIONS TO UPDATE NATURECULTURE RELATIONSHIPS

In this section, two design concepts are outlined, which address the updating of natureculture relationships among shepherds, farmers, and more-than-humans beings. They can be conceived as "design interventions", in the words of Halse and Boffi [24], who define them as form of inquiry for investigating complex, under-specified phenomena, still in the process of being conceptually and physically articulated. They are used to describe an engaged research method, not to test an envisioned solution, towards enabling new form of experience, dialogue, awareness about the "issue". As such, design interventions provide also a good strategy of complexification [28], when it is necessary to re-frame social, cultural, environmental relations by unfolding all the stakes, values, knowledge of human and more-than-human involved. The first design intervention is about updating co-existence relationships among a shepherd,



Figure 10: A moment from the co-creation with shepherd Angiolina, attending at sheeps drinking and assessing how they dip their mouth and which body part gets wet.

her/his sheeps and the other more-than-human beings in the pastures; the second one is about updating the caring relationships between local people and wild trees.

4.1 An encountering path for the shepherd, the sheeps and the newts

"An encountering path for the shepherd, the sheeps and newts" promotes an intimate, individual journey for the shepherd to get to know the newts which the sheeps share the drinking troughs with, as well as for the sheeps and the newts to be engaged in the process of revealing themselves and each other as commoners sharing the trough. The aim of this intervention is to experiment with, and possibly enable, new ways of inter-species co-existence and relationships (in this case human, sheeps and newts) beyond the anthropocentric dualism of human- non humans, and hopefully to attend to how the newly-configured collective of human and non humans will in turn shape the shepherd's grazing practice, in line with Haraway's concept of *becoming with* [25], towards an updated pastoralism natureculture. The path will unfold throughout the montication season and, to begin, it will involve the shepherd Angiolina in the spring and summer 2023. The intervention will revolve around the drinking trough as "the common", which defines an entanglement of shared resources, humans, non humans, institutions, rules, principles, and practices concerned with the preservation and enrichment of such resources [39] [8]. As commoners, the actions will engage with the shepherd, the sheeps and the newts in their conscious (by the humans) or not conscious (by the non humans) practice of managing, using and benefiting from the drinking trough resource for the collective's benefit [38] [7]. The strategy will be to make the commoners visible to each other in the act of sharing the trough. The intervention will unfold in two phases: an environmental DNA analysis (eDNA) of the water inside the trough to assess the presence of newts [5] [44]; and photo-trapping newts as they get into the trough and/or live in its water [22]. The researcher has been conducting a co-creation phase with shepherd Angiolina and her sheeps, to try to actively involve the sheeps in collecting the water sample for eDNA in the moment they drink from the trough [Fig.10]. The idea is either to equip the sheeps with some kind of wearable elements absorbing the water for the sample (a spongy bridle for example) or to equip the trough with a

floating element which will be submerged when sheeps bath their mouths to drink. The shepherd will then collaborate by collecting the sample and carrying on with the eDNA sample preparation procedure. Engaging the sheeps in the eDNA process is conceived as a way to reveal the sheeps as commoners of the trough and participant of the *new-collective-to-emerge* shepherd-sheeps-newts.



Figure 11: A newt climbing the steps of the trough. [Frame from a video released by the EU Life project "Wet Fly Amphibia"]

For the photo-trapping instead, it is needed that a camera trap is either installed inside the trough or on the little steps that some troughs have at a side to favour newts climbing to reach the water [Fig.11]. In the latter case, the newts could activate the photo trap on their passage. The shepherd will be provided with a mobile app to follow the phases of the own encountering path, and mapping and retracing the own experience.

4.2 Trees caring for agrobiodiversity conservation

"Trees caring for agrobiodiversity conservation" aims to restore and update customary local people actions of care for wild trees and plants by leveraging on the genetic and biodiversity value they hold for the territory and beyond. The aim of this intervention is to experiment how to (re)activate the care for wild plants when traditions may result obsolete to people, or people forgot those traditions or those traditions never really belonged to the younger

generations. As a strategy, the intervention will suggest a "community management of care", where wild trees are cared by a multitude of people which share the different tasks which trees caring may imply, such as monitoring for scrub encroachment; planning for physical actions; fruits picking. As a motivation, instead, the intervention will leverage on two different scales: 1) the local scale and 2) the global scale. On the local scale, the intervention will emphasize the role that ordinary citizens can play to maintain the territory biodiversity through tangible actions, which imply a direct contact with nature and get dirty with it. On the global scale, it will contextualize the local actions of people in the global picture of food security and biodiversity conservation actions undertaken worldwide by prominent institutions. This is why the design intervention will engage with both the members of the local communities (ordinary citizens and farmers), as well as scientists and agricultural experts. The intervention will be locally based and unfold in three phases: mapping, co-creation and prototyping in the wild. Mapping refers to a participatory mapping session where a group of ordinary citizens of different ages will map on a physical plan their memories related to wild plants that used to be cared, as well as the traditions attached to such plants. Co-creation refers to the collective ideation and negotiation of a management plan of care and possible tools that could aid the tasks over time, from the creation of an app, to a radio station or the use of a drone to monitor the trees. Particular attention will be given to the selection of any digital tool involved (or developed), following Bettega et al. suggestions on how the sustainability of the results could be fostered by the adoption of digital commons [2]. Eventually, prototyping refers to rehearsing the care procedures in the wild with actual participants.

5 CONCLUSION AND FUTURE WORK

This paper described the natureculture of agropastoral Abruzzo, a region in central Italy, and focused on two specific ethnographic accounts, respectively of a shepherd and of farmer. The fieldwork foregrounded an embodied *eco-commoning* approach to farming which has been inherited from the ancestors and has contributed to shape, enrich and preserve the current environmental landscape. On the other hand, the re-activation of traditional agropastoral activities in the actual context may present novel challenges and hidden risks to unintentionally fail in reciprocal care among farmers and the more than humans, due to the modified environmental and anthropic conditions, the different current approach to environmental conservation, the knowledge gap between the growing scientific knowledge and the discontinued indigenous local knowledge. In an attempt to update natureculture relationships, the paper presented two initial ideas of design interventions: one to enable the creation of a co-existence relationship among the shepherd, the sheep and the newts, the other one to (re)activate local people care for wild plants. In the next future, the work will focus on the implementation of the design interventions in the wild and technical prototypes, engaging citizens and experts in order to emphasize the local and global role of participants in the conservation of biodiversity through *updated* traditional agropastoral practices.

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