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Becoming a forester. Exploring forest management students' habitus in the making

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ABSTRACT

Foresters in Germany are facing extreme challenges due to climate change and social change, struggling to adapt their management strategies. In this context, our study explores the professional socialization of forest management students at Universities of Applied Sciences in Germany: How is a professional habitus formed during forestry education, and how well does this equip students to address ecological and social transformations? Through qualitative in-depth interviews, we investigate how students experience their education and interpret their future roles and tasks. Using a praxeological framework informed by Bourdieu's concept of habitus, we explore how higher education shapes students' ways of perceiving, feeling, and belonging.

Findings from our analysis include students' hierarchical positioning in relation to a lay public, their objectivist perspective on knowledge, their identification as part of the "forest family", and mechanisms of inclusion and exclusion that produce a strong sense of group cohesion. Despite inner heterogeneity in the student body, adaptation pressure is high, especially for those who envision a career as a forester. The students themselves see two main challenges for their professional future: social pressures from a lay public and an unpredictable future due to climate change. We argue that their problem definitions actually point to underlying transformation challenges.

Our findings are in resonance with recent debates on forestry's professional culture, its implicit foundations, and its challenges with respect to change. They also point to a potential role of educational institutions to foster diversity in the student body and promote transformation competencies.

1. Introduction

In Germany, forests are simultaneously managed for wood products, biodiversity, and recreational activities, in line with the paradigm of sustainable forest management (SFM) (Borrass et al., 2017). With climate change-induced challenges related to for instance droughts, pests, and fires, new priorities emerge: managing forests for adaptation to uncertain ecological threats. The forestry sector finds itself amid drastic changes and has become an object of public controversy (Mack et al., 2023). Financial support for the sector and new legal frameworks are being negotiated. Also, civil society has gained more say in forest management decisions in Germany, partly due to deliberate administrative initiatives for participation, and partly due to bottom-up initiatives, for instance tree sittings and citizens' initiatives (Bethmann et al., 2018; Kaufer, 2023). Some initiatives opt for a paradigm change in forestry, especially questioning wood harvesting and active

reforestation strategies. Others take general demands of socio-ecological transformation (e.g., mobility, renewable energy, etc.) to the forest, with forests being a widespread symbol of nature and wilderness overall in the German context (Bundesministerium für Umwelt et al., 2014; Knauf, 2021).

In this changing ecological and social climate, the professional role and identity of foresters undergo new challenges. In this study, we look at forest education as an important steppingstone in forming professional identity and self-understanding. In their academic studies, forestry students learn what "being a forester" means: they internalize the practices and norms of forestry as a social field they aim to enter (see Section 2). Higher education at least partly shapes the knowledge, understanding of roles and values of the future generation of foresters. Against this background, our study seeks to understand how students of forestry acquire a professional identity (or habitus) and how well this prepares them to deal with transformation.

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In pursuit of this question, we present results from an empirical study of the professional socialization of forestry students at Universities of Applied Sciences in Germany.¹ In Section 2 we propose a praxeological perspective on the emergence of professional identities based on higher education research. With Pierre Bourdieu, we understand professions to be shaped not only by specific competencies, but also by a learned habitus and culture. We then apply the notion of habitus in our review of existing studies on forestry professional cultures with a regional focus on Germany. In Section 3, we explain the study's research design, before presenting and discussing findings from our empirical analysis in Section 4, including students' positioning in relation to a lay public, their identification as part of the "forest family", mechanisms of inclusion and exclusion that produce a strong sense of group cohesion, and their agency in dealing with (climate) change. Section 5 discusses the main arguments, asking to what extent students' understanding of their role prepares them to deal with challenges ahead, drawing on recent scientific debates on forestry as a sector in transition.

2. Becoming a forester – Perspectives from praxeology and education research

2.1. Forming the professional habitus in higher education

What is learned in a university is not restricted to curricular content – it implies ways of perceiving, feeling, and belonging. Empirical research in higher education reveals what is referred to as secondary socialization (Berger and Luckmann, 1969) – one learns "being a forester", not only professionally, but also culturally. The concept of "disciplinary cultures" – also provocatively referred to as "academic tribes" – and their impact on professional knowledge and self-image in different disciplines have been examined by Becher & Trowler (cf. Becher and Trowler, 2001; Trowler et al., 2012). Each of these "scientific tribes" develops and maintains not only its own norms and values, but also basic epistemological beliefs and bodies of knowledge in its own "scientific territory". With these provocative observations about the logics of the academic field, the authors initiated the "cultural turn" in higher education research. Higher education institutions in this sense play a crucial role in shaping professional cultures.

A central theme in this line of research is that common, shared bodies of knowledge develop within cohorts of students throughout their studies (cf. Abels and König, 2016, p. 152). Certain role expectations, values, and attitudes exist within an academic discipline largely independently of the respective – and constantly new – cohorts of students and their individual characteristics. What may initially seem strange and questionable to the students will be internalized over time and thus become a matter of common sense (for an example from sociology see Kiefer et al., 2018). Students adopt specific vocabulary, interpretative frames, codes of conduct, and values during the transition from the lower to the higher semesters and pass on this internalized knowledge in contact with other students. 'Internalization leads us to identify ourselves as members of a common world and to define and maintain this

¹ The study "Woodcutter or Climate Savior? The Emergence and Change of Forest-Related Values and (Future) Professional Role Conceptions of Forestry Students" (in German: Holz knecht oder Klimaretter? Entstehung und Veränderung waldbbezogener Werte und des (zukünftigen) beruflichen Rollenverständnisses von Forststudierenden") consisted of two subprojects: In the first subproject, conducted by Prof. Dr. Stefanie Steinebach and Leonard Sauter at Rottenburg University of Applied Forest Sciences, a questionnaire was sent out to all German forestry Universities of Applied Sciences to determine whether the values and role expectations of forestry students change during their studies. The second subproject, based at the Forest Research Institute Baden-Württemberg (FVA), explored students' identities and professional socialization using qualitative in-depth interviews with forestry students. Results were synthesized and discussed with representatives of the participating universities (final report forthcoming).

world as our world through our common practice in front of each other and with each other' (Abels and König, 2016, p. 155, passage translated by authors).

Following the cultural turn in higher education research, we adopt a praxeological perspective in our analysis: we look at socialization processes in forest education as the making of a professional habitus. According to Pierre Bourdieu (1995), a habitus is "the socialized body; the dispositional core of the practitioner whose every virtue, subservient and rebellious, is a structural necessity and whose every compulsion, subservient and rebellious, is a structural virtue" (Bourdieu, 1995). This socialized body incorporates and internalizes social norms and transforms them into personal dispositions, preferences, and tastes. Habitus organizes perceptions and valuations that correspond with the necessities and expectations of the social fields which themselves are based on the doxa. The term "doxa" refers to an ensemble of assumptions that are accepted without question. In times of crisis the taken-for-granted, the doxa, can be shaken. Then struggles between orthodox and heterodox positions within the field occur, inducing change, despite the habitus' tendency to stabilize the status quo (Bourdieu, 2015, pp. 318–334). Habitus, therefore, tends to conserve a status quo, but it does not determine the options for action, it merely limits the range of actions (Sonderegger, 2016, p. 68) and in this respect also hold emancipatory potential (Cichecki, 2022; Harker, 1984). Likewise, higher education institutions act as gatekeepers of disciplines and professional identities on the one hand, but on the other hand have always responded to changing societal demands (Sporn and Godonoga, 2024) and thereby induced change in the professions they educate. Bourdieu's concept of habitus helps us to understand students' professional identity, even though the concept of "identity" itself does not play a central role in his work. Through the habitus concept, Bourdieu links individual experiences and actions to social structures that shape them and vice versa. Identity, too, can in consequence be understood not (only) as a product of conscious reflection or free choice but mainly as the result of habituated, incorporated practices embedded within social contexts (Bottero, 2010).

One of such contexts are the respective social fields of the professions with their idiosyncratic valuation systems (Lahire, 2015, p. 72). In a habitus, gendered, class-related and field-specific aspects are merged into ones' embodiment – or fail to merge, leading to low positions or exclusion from the field. In higher education research, Bourdieu's theory has been used to understand how a field-specific habitus is acquired in a second socialization. Social actors bring certain habitual dispositions with them when they enter fields, in line with their individual class-specific, ethnic, cultural, and other characteristics. On top of that, they develop specific 'habitual imprints of their educational and professional careers' (Hofbauer, 2010, p. 35, passage translated by authors). These dispositions are neither static nor determining, but allow for individually generating 'suitable' actions that reproduce and reshape field and habitus in turn (Bourdieu, 2001b, p. 126). It follows that forestry students do not have to have a complete fit with the field at the beginning of their studies, but when a student's habitus is too deviant to adapt to the disciplinary culture, the barrier to staying on in the field will be high.

2.2. Empirical perspectives on forest management culture and education

So far, there are almost no studies exploring higher education in forest management in Germany. There are however several studies exploring aspects of forestry culture in educational institutions on an international level. For instance, Brack (2019) and Walmsley et al. (2015) demonstrate, for Australia and Great Britain, that the importance of traditional forestry degree programs is declining in favor of programs designed with a greater focus on interdisciplinarity, stressing the need for foresters to adept transdisciplinary problem-solving. Rodríguez-Piñeros et al. (2020) and Waeber et al. (2023) advise innovations like soft skills training and game-based educational tools to enrich and widen

learning experiences (see also Wallin and Brukas (2024)). Owuor et al. (2023) analyze forestry students' study motivation and career goals on a global scale. The authors find intrinsic motivations such as beneficial work, job satisfaction and working outdoors to be the major driving factors for taking up forest-related studies. In terms of career options, students prefer jobs that have a positive impact on the environment and are less inclined to work in forest industries and wood processing. However, their sampling includes all kinds of forest-related degrees, whereas our study focuses on degrees that qualify especially for a career path in multifunctional forestry organizations and administrations. Across most studies, a consistent picture emerges, which Rodríguez-Piñeros et al. (2020) summarize: "While those studies are regional or country specific, they all concluded that there is a need to enhance and incorporate a set of competences that allow forest graduates to work and communicate with people from other disciplines and backgrounds, and to integrate subjects that acknowledge the diversity of values and services that forests provide." (p.2) Another empirical basis on which we build here is research on professional cultures in forest management, specifically in the context of German forest administrations. Here, we reframe results from this research through a praxeological looking glass, rereading them as a portrayal of the professional habitus that students are educated to achieve.

Studies on professional and organizational cultures in forestry (Kaufman, 2006; Kenntner, 2014; von Detten, 2022; von Detten and Mikoleit, 2022) point to a professional ethos that is characterized by commitment to traditions and hierarchies, reverence for experience and local knowledge, strong in-group identification, and the implicit understanding of nature as being relatively resilient and controllable. The forestry sector is characterized by a pronounced self-confidence and a sense of unity. Foresters proudly refer to a shared history (300 years of sustainability, formerly powerful social position), possess unifying symbols (for instance formal uniform, informal "green" dress code, hunting dogs) and privileges (hunting, special access to the forest) that make them clearly visible as a group both internally and externally. Their professional identity is formed at few training locations – with the associated shared experiences and "esprit de corps". Due to strict formal criteria for a career in German forest administrations, these institutions are extremely homogeneous with little disciplinary diversity. This strong organizational culture (Kenntner, 2014) is supported by strong, shared convictions, affirmation of social hierarchies, and a clear demarcation against demands and unwanted interference from "outside". Foresters tend to shield themselves from criticism through a protective wall of internal solidarity and professional self-confidence.

Similar traits have been observed in studies on foresters' external communication (Bethmann et al., 2018; Maier and Wirth, 2018). Professional identities have been identified as a potential escalating factor in current forest conflicts due to a devaluation of non-expert knowledge and sentiments and a strong sense of unquestionable expertise and authority (Bethmann et al., 2018). In many respects, being a forester means more than just being a professional; it goes along with a way of being, partly similar to the rural masculine habitus that Desmond (2009) has found in the US firefighter (see also depiction of forest workers professional identity in Weinbrenner et al., 2022). Feminist readings of forestry's professional cultures show how closely conceptions of forest nature and gender are entangled in forestry, placing hierarchical dualism of nature/feminity/passivity in contrast to culture/masculinity/agency at the core of professional beliefs and routines (Katz, 2011, see also von Detten, 2022), but also point to less salient, even repressed caring aspects of foresters relationships with forest nature (Himes and Dues, 2024; Kolar and Baerlocher, 2016; O'Flynn et al., 2021). And on closer look, there are more contradictions to be found: On the one hand narrations of control and decidedly proactive management are integral to the self-understanding of the discipline, on the other hand this has always been in tension with the century old reality of managing ecosystems long-term under conditions of uncertainty (von Detten, 2022).

Though they work with different theoretical frameworks, the studies

quoted here clearly paint a picture of a professional habitus in forestry. This picture is astonishingly consistent with a much older study, first published in 1960, on the culture of forest administrations in the USA (Kaufman, 2006). Both older and newer studies persistently diagnose a marked resistance to change within professional forestry culture (Kaufman, 2006; Kenntner, 2014; von Detten, 2022; von Detten and Hanewinkel, 2017; von Detten and Suda, 2020). However, contradictory aspects within this habitus could be starting points for transformation and adaptation to new challenges. This perspective is even more relevant as the discipline and profession are in the midst of ecological and social transformation processes – how will future foresters be equipped for such challenges in terms of professional culture and habitus?

3. Methodology

For accessing the formation of a professional habitus in students, we use qualitative interviews and elicit detailed accounts on students' personal and academic experiences, their projections on becoming foresters, and their relationships with social groups, institutions, and forests. In such students' accounts we look for answers to a number of heuristic questions: What defines 'being a forester' for forest management students? What roles and tasks do they attribute to it? How is this understanding acquired? And how does this relate to changes they anticipate to encounter? In sum, these questions serve to explore the students' emerging professional identity in the face of transformation. The data corpus consists of 19 qualitative, in-depth interviews with B.A. forest management students from three different Universities of Applied Sciences that educate specifically for a career as a forester. Thirteen interviews were conducted with male students and six with female students, approximately reflecting the gender distribution of Bachelor's students in forestry in Germany, where the current proportion is one-third women and two-thirds men enrolled (BDF - Bund Deutscher Forstleute, 2023). The interviews were conducted using a guideline with open questions and meant to prompt narratives on the students' experiences, an assessment of their curriculum, and their view on forests and forestry as a profession. The sample contrasts students at the beginning and at a late stage of their studies. Some of the interviewees had at the time of the interview moved on to a master's degree and now studied forestry-related study programs at other universities, namely forest management, forest sciences, and environmental forestry.

All interviews were transcribed using the GAT2 transcription guidelines (Selting et al., 2009). The interview transcripts were analyzed sequentially, following the unfolding logics of narrations and arguments throughout the text, interpreting the interviews as documents of situated speech action (Ploder and Mcelvenny, 2022). We based our analysis on Jan Kruse's "integrative basic procedure" (Bethmann, 2019, pp. 73–103; Kruse, 2015). The core of this method is the micro-linguistic and sequential analysis of the interview text. The interview segments used for the analysis were selected based on the project's thematic questions and on formal criteria. The latter means that we chose passages that particularly stand out in the interview in terms of semantics, textual structure or interaction dynamics – that have so-called "metaphorical density" (Bohnsack, 2010, p. 104). This strategy of sampling interview sequences within the corpus was organized in the circular fashion of "theoretical sampling", allowing for in-depth analysis of short sequences while connecting analytical results across data to uncover overall patterns. Large parts of the analysis took place in analysis groups to bring together different analytical perspectives on the material and jointly validate interpretations. In line with grounded theory methodology, memos, visualizations, and mappings were used as analytical tools to understand patterns and structural features of results across the data corpus (Charmaz, 2014).

When analyzing the respective sequences, agency analysis and positioning analysis were used as heuristics that helped us to gain a deeper understanding of the internal logics of the individual narrations, to then uncover patterns across interviews, and form a more wholesome

picture of a habitus in formation. Agency analysis was used to investigate to whom students attribute agency and thus also accountability for actions (or omissions) (Bethmann et al., 2012; Löwenstein, 2022). Agency, defined as the power to act, can be attributed to persons but also to objects, institutions or anonymous powers such as fate, bad luck, nature, etc. Agency analysis has helped us to explore how students anticipate their prospective role and self-efficacy as foresters who take actions and decisions, their perceived situatedness in networks of distributed agency in social and natural environments, and also implicit nature conceptions that are tied to professional identities, for instance constructing forests as objects of human intervention and care. Positioning analysis (Korobov, 2001; Lucius-Hoene and Deppermann, 2004) is used to understand how interviewees position themselves in relation to other human and non-human agents, and in relation to objects of discourse in a social space. The sequential analysis is based on heuristic questions that we put to the interview texts: How do forestry students portray themselves? How do they position themselves in relation to their future work, to the presumed areas of responsibility, and other people - fellow students, teachers, future colleagues, stakeholder groups, and society? How do they sense that they are perceived or categorized by others? What positions do they assign themselves and the organizations they will work for later?

On these grounds, our analytical strategies go beyond “the content” of interview statements. Our findings thus represent interpretations of a “second order”, in the sense that they treat explicit statements as the material from which implicit meanings, norms, and worldviews that are rooted in collective cultures can be reconstructed. With this reconstructive methodology (with regard to the specifics of the German methodological debates, cf. Bethmann and Niermann, 2015; Pfaff et al., 2010), we trace the internalization and habitualization of field logics – what Bourdieu calls the “illusio” (Bourdieu, 2001b, p. 129). Linking individual (speech) action in terms of collective practices and field logics is the basis on which we generalize our interpretations. Generalization here means that through the analysis we can portray structural features of an orthodox culture in forestry education, which of course can be contested in individual (heterodox) positions. Such “negative cases” (in the sense of contrastive) were scarce in our data and pointed to experiences of peer pressure and exclusion. In the following section, we use quotes to illustrate our findings. These quotations therefore are not to be understood as proof of the validity of our interpretations; rather, they are particularly pointed expressions of patterns that we were able to reconstruct from the entire body of data. All interviews were held and analyzed in German. The data was translated for this article.

Our work is based in the social science department of the Forest Research Institute Baden-Württemberg (FVA), a state-funded research institute that is formally part of the forest administration. At the same time, as social scientists without a forestry degree, we bring an external perspective. The interviewees as well as the cooperating Universities of Applied Science tended to perceive us as both part of and distinct from the forestry field. This is a door opener in two respects: On the one hand, we come from a trusted institution, on the other hand, we listen like a neutral and curious stranger. Especially in discussing findings with university professors, we found that our supposed “outside view” was valued, while professors felt their own view was limited because the field’s culture is their own taken-for-granted reality. To use a metaphor, we develop below in the empirical findings, we are positioned at the border of the forestry bubble.

4. Empirical findings

4.1. Talk well and sell yourself – students’ understanding of change as a “communication problem”

One of the most important topics that students bring up in interviews is the public perception of forestry, its image and related social developments. Early on in their studies, students gain the impression that

the forestry world has difficulties in claiming their position in a changing society. They interpret this difficulty as a “communication problem”. They anticipate that communication with “society” is an important part, if not *the* most important part, of their role as future foresters. The following interview excerpt illustrates this pattern.

“Well, I think above all you have to be able to talk well, to sell yourself well somehow, because you have to deal a lot with people who have a different level of knowledge than you do. And I think you must never lose sight of the fact that you’re just on a different level somehow and have to bring that across to people, so I think you just have to be able to communicate very well.”

This short sequence of an interview shows that communication is seen as extremely important by the students. Also, it gives insight how communication is understood: primarily as a matter of “explaining” oneself and one’s professional actions in the forest in a “top down”-process. The economic expression “selling oneself” is more reminiscent of PR than of mutual communication. In a strict semantical sense, the product sold here is not forestry and its logics, or a specific management measure that has been taken, it is “oneself”, which displays an intense personal identification with one’s work. In the sequence “...and have to bring that across to people”, the agency of communication lies exclusively with the potential foresters, not with the generalized “people”, who are mere addressees. This type of communication takes place under the assumption of knowledge hierarchies (“different level of knowledge” and “on a different level”), which must be maintained, and includes a warning not to become careless (of a possible danger). Attention to this hierarchy must be constantly kept in mind (“you must never lose sight of that”). Overall, the passage is about sending rather than inter-acting, and conveys a sense of urgency to be heard and believed.

For students, communication often primarily means making their own expertise clear and their own actions in the forest plausible. This is coupled with the expectation of being understood as a result. All in all, communication is framed as persuasion. Being convinced, changing one’s own point of view, or collaborative learning is not part of this understanding of communication.

Curiously, we did not find any contrasting understandings of communication in the interviews. There are contrary statements, for instance an acknowledgement of the importance of “eye level” conversations, or that foresters should not have “blindness” on. But when students elaborate on their expectations of such communication, it is still about explaining, passing on knowledge and unilaterally sending a message.

In these cases, especially when students are confronted with changing societal demands, we observe a gap between emerging, more participatory ideals of expert communication on the one hand, and a habitualized self-understanding as *the* forest experts that hold exclusive power of definition and knowledge superiority. Openness and mutuality are emphasized only “rhetorically”, while a clear hierarchy is created on an implicit level – this may in fact hinder rather than help more open forms of communication to evolve. The hierarchical impulse remains rhetorically concealed and is therefore more difficult to address.

4.2. Identification as an expert – Acquiring the legitimate gaze

Linked to their interpretation of change as a communication problem is the question of how the future foresters position themselves in relation to other actors, or rather: to other perspectives on forests, and how their view of forests is shaped. It has been shown above that a hierarchical understanding of communication prevails, which is also linked to a hierarchical understanding of knowledge. Even in their early semesters, when their professional knowledge is likely still very limited, students strongly argue for and defend the superiority of forestry over other perspectives in defining what a forest is and how it ought to be managed. They begin to claim the “legitimate gaze” for themselves that holds power of definition over other perceptions (we use this phrase in

reference to Bourdieu's notion of "legitimate taste" (Bourdieu, 1996, p. 16)).

A first step to taking this stance is learning to esteem the profession, and to identify with it. Our findings indicate that students connect deeply with their future professional field and, more generally, with the "forestry world". Entry into this world is often characterized by initiation stories. Many students are very impressed by the practical work in the forest and by the skills of the lecturers and practitioners.

"So in the end it will be my profession to take care of this piece of forest that some community gives into my care, so to speak. And accordingly: this will be an honorable task or a responsible job, which I naturally want to carry out with all my expertise, as best I can".

This quote illustrates the students' strong identification with the profession. The notion of caring (in contrast to other possible semantics like "managing") implies a protective sentiment, emotional involvement and personal responsibility. The phrases "my profession" and "honorable task" indicate that the speaker understands it as more than just a "job". It rather carries the weight and significance of a vocation, associated with honor and responsibility. The arrangement portrayed here implies a strong personal and professional investment in the future profession, which is fervently embraced.

The assertion "in the end, it will be my profession" shows that the future role is already considered as a given. This passage also reveals something that appears in many sections across all interviews: Students see themselves as part of their future professional field long before finishing their studies, and long before beginning the mandatory two-year practical training. Consequently, it is often impossible to discern in the analysis at what point they refer to their study program, or to their future professional field. In terms of language, they consistently include themselves in the group of foresters even in the early semesters of their studies, using the collective "we" in their discussions about their future role or adopting a robust defensive stance towards external criticism.

4.3. Acquiring objective knowledge and shared opinions

In addition to this high level of identification, the students describe how their perception of the forest changes throughout their studies, often immediately after entering the study program. They frame this as a process of acquiring objective knowledge, which goes along with an ontological change in their perception of "what a forest is".

Speaking about their studies, the students position themselves as passive recipients of knowledge that they perceive as objective and do not question. For example, they stress that the ability "to memorize" is an essential competency in forestry studies. What they learn leaves a mark ("of course it's totally imprinted"), especially when absorbed as visual evidence in the field ("because it just stays in your head better if you've seen it yourself").

The learning process is also experienced as an adaptation in the sense of developing in-group homogeneity.

"Yes, so we all have the same principles, the same basic opinion. And of course there are some differences, but on the whole ... especially because there are only 25 of us on the Master's course, we kind of form a team and, well, it all fits quite well."

Throughout the interviews, we can trace several narrations that represent such shared "basic opinions". These are presented with great assertion; for instance "...this climate story. So you have to harvest in order to protect the climate, that's just the way it is."

Students are introduced to a world of knowledge that is built on objectivity and authority - perceived as neutral, and beyond doubt. The content of this knowledge is interpreted differently by different students, but is nevertheless always presented with great conviction, often with reference to scientific studies ("science is the only thing that is really true"). There is little room for critical questions, weighing of arguments,

for discussing contradictory study results and different positions, even within the students' community.

4.4. Epistemic hierarchies

In the communication pattern that we explored in Section 4.1, we have already glimpsed a phenomenon that we want to discuss more at this point: the epistemic hierarchies that are implied in the construction of "us" (experts) and "them" (the lay public). When it is assumed that one holds the right, true, and objective knowledge, grounded in the scientific and practical knowledge of the forestry community, other ways of perceiving forests can easily be discounted and devalued. Accordingly, when speaking of "the people" as interviewees often do, they tend to state general opinions about these people's limited and even flawed viewpoints.

"I believe that people who are very far away from the reality of forestry and agriculture often have very romanticized and glorified views that lead to completely unrealistic ideas of what is possible and what is not."

Like in this quote, the public is repeatedly portrayed as unrealistic, glorifying, emotionalizing, romanticizing or naïve with respect to land use and human-nature relationships. To position themselves as experts in the making, students strictly distance themselves from 'the population', 'society' or even the 'civilian population', as it is called in one of the interviews, adopting a military jargon. The unity of the profession as a social group is produced through an act of (hierarchical) othering. We have shown above that exactly such a hierarchy is inscribed in the students' understanding of communication. This is well illustrated in the following quote:

"Yes, somehow everyone thinks the forest is great, but hardly anyone understands what's really happening in there. We have to blame ourselves for that, we don't communicate well enough. And if people somehow have a connection, it's because they've somehow read something in the newspaper or a book and then suddenly think they know how the forest works."

Even when claiming the role of a "neutral mediator", students still devalue an understanding of forests which they ascribe to the wider public, because of a deeper conviction that their professional knowledge is objective, reliable, all-encompassing, embedded in a more accurate understanding of nature (unlike naïve romanticism) and therefore cannot seriously be contested. In consequence, forestry's communication problem, in their view, is grounded in the fact that its "communication is not yet good enough", i.e. that the "correct" and "unglorified" image of the forest has not yet been sufficiently communicated to the outside world.

In some of the interviews, students reference their own former lay perspective on forests and describe a process of change. Their view and language are shifting towards technical and economic perspectives, defining forests as objects of management and commercial activity. In few cases, the emotional attachment and aesthetic pleasure are mentioned ("But I still really enjoy it, I still think the forest is just as beautiful as it used to be"); but then they are juxtaposed against the professional gaze, portrayed as *surprisingly* compatible. Knowledge of recreation, aesthetic and non-instrumental values of forests appear neither in students' depictions of study curricula nor as an integral aspect of their future work. Generally, personal or emotional aspects in forest relationships are deemed decreasing over the course of their studies, or are downplayed:

"Interviewer: Ok, that means you walk through the forest with a bit more of an attentive eye, [Student: Yes! Definitely!] And you said that you also go into the forest a lot with your friends. That means you also like going into the forest outside of your studies?"

Student: Yes, well, not like before, where you just walked through and thought: *boa cool!*"

Becoming a forester in the interview narrations is a matter of acquiring the "new" perspective on forests relatively quickly and internalizing this view as a professional "legitimate gaze", thus also developing a sense of belonging to the forestry world in distinction to lay out-siders and one's own former self.

4.5. Entering the "forest bubble" – How students feel that they fit

We have seen that students already strongly identify with the profession, coalescing with particular assumptions about forests, objectivity, and non-foresters ("people"; "civilians"). It has become clear that their sense of belonging is not exclusively based on abstract expertise but also on social and cultural components – sharing beliefs and feelings of belonging. This constitutes what we call the "forestry bubble", which is an in-vivo code from one of the interviews. The term encompasses the social group of both students and professionals in the field of forestry. In this section, we further explore how such a common culture is established and reproduced in students' everyday life and education.

A recurring theme in the students' stories is the contrast between the "forestry bubble" and "society," with the latter being depicted as external to the forest world. This suggests that the "forestry bubble" is not defined by internal homogeneity but rather by its distinction from the outside. Within this "world of forestry" exist individuality, variety, internal criticism, and diverse subgroups that are held together by the centrifugal forces of identification (see also Kaufman, 2006).

Students engage with critique of the bubble and in the bubble in very different ways: On the one hand, they perceive themselves as constantly under scrutiny from various external groups, such as hunters, the general public, and even other foresters. The following interview section illustrates that:

"The question was what characterizes a forester, right? Ok, phew, yes: I think you need a thick skin to deal with all the criticism that is bound to come your way"

The sense of being "under attack" leads to a defensive attitude and therefore contributes to the closure of the "forest bubble". On the other hand, some students express a strong desire for a more nuanced engagement with different perspectives on forests during their studies. They are eager to critically examine various viewpoints but claim that some of their instructors categorically dismiss deviating perspectives. This defensive stance shields from outside criticism, but at the same time restricts internal discussion that some students consider crucial for their professional development. They find themselves in a difficult position, desiring an environment conducive to constructive criticism in the "inside" while at the same time feel they have to protect their future professional field against attack from outside.

The dynamics and contradictions inside the bubble can be pictured as struggles between center and periphery of the field, with students occupying different orthodox and more heterodox positions (see Section 2) within this spectrum. Some are determined to leave this bubble and seek to connect with other social groups and professional fields (heterodox). Others want to anchor themselves even more firmly at the center (orthodox). In this respect, it is interesting to take a closer look at processes of inclusion and exclusion.

During secondary socialization (that takes place in schools, universities, colleges, workplaces and peer group, see Section 2), selection and exclusion processes also always take place, especially when no proper fit can be established.

Students need a sense of belonging especially when they want to commit to a career as a forester. In this central position of the field are mainly students for whom a fit with the "forestry world" is established very quickly – either during or even before their studies, for example through family provenance.

The following quote from an interview with a student from a high semester, serves as an example of what secondary socialization can look like over time and retrospectively.

"I came to [place of study] with the idea that I wanted to change something. That a lot is being done wrong in forestry and that we need to find new ways. And I have to say: now that I have a better understanding of biology on the one hand and an economic understanding of what is possible, why we do what we do, and what we do today, I have become - in quotation marks - more conservative. Simply because I now understand much more: why we manage the forest the way we do. And why we generally manage forests and don't just leave them alone, as many of the civilian population (...) demand. So, I have to say: a lot is being done right now and I think we sometimes forget that. "

The dynamic of secondary socialization can be clearly seen here: Students start their studies with a certain idea (the urge to change something), which then changes in the course of their studies – an adaptation takes place, the field-specific requirements are accepted and adopted. Incidentally, it is also apparent that at this point students already see themselves as part of a group (the "forest bubble"); the "we" form is used throughout, even if the student is not yet a practitioner.

Adaptation in part takes place as internalizing shared knowledge, values and opinions, but it is also connected to processes of embodiment. Among students circulates an image of the "ideal-typical forester" that holds significant influence, as it guides the students in either aligning themselves with it (clearly positioned within the forestry bubble) or distinguishing themselves from it (rather in the periphery of the bubble).

"In fact, those who later become foresters are often the ones who actually prefer hunting; they like to have dogs, drive Jimny cars,² wear fleece and felt clothes. So they are very stereotypical."

Depictions of the ideal-stereotypical forester are often organized around physical and material attributes that symbolize a way of life such as clothing, dogs, and off-road vehicles like in the excerpt above. To truly become and remain a part of the forestry bubble, it seems essential for the students to fulfill such ideals at least partially. The further students drift away from incorporating aspects of it, the more likely they find integrating into the "forestry bubble" challenging. Performing only in terms of formal course content, cannot fully compensate for a "non-fit". In some students' accounts both are depicted as intertwined: for instance, that non-fitters tend to a "too strong" focus on ecological or social aspects of forestry. So, in the periphery we can see that there is diversity" *within* the "forestry bubble" and struggles for belonging and identity can become a problem for students who do not fit that well into the picture of the ideal-typical forester. When students realize that they do not fit well, they tend to consider different career paths, even though becoming a forester was the goal of almost all students at the beginning of their studies. Internships during the forestry course also play a major role in this decision. Students who have decided against a career as a forester, often mention feeling uncomfortable during their internships. This does not necessarily mean that they drop out of university. It rather means that they adjust their career aspirations and, for example, complete a more scientifically oriented forest sciences degree after their management-oriented primary forestry degree.

² The Suzuki Jimny is a small off-road vehicle, designed with a simple construction and compact size, making it suitable for moderate off-road use. It is commonly used in forestry in Germany due to its maneuverability on narrow trails and ability to navigate rugged terrain. As such, it is often considered a token of forestry lifestyle.

4.6. Preparing for the unknown – How students perceive their agency in dealing with climate change

We have so far portrayed how students frame forestry's communication problem and how their own assumed communicative position as future experts is acquired and legitimized. Their interpretation of relevant knowledge, and the development of group cohesion and professional identification during their studies are important building blocks of what many of the interviewed students see as *the* most important challenge of their future professional lives. In this section we look at the second great challenge that is mentioned in all interviews: Dealing with the effect of climate change on forests. Data indicate that students are aware of this challenge very early in their studies. These accounts of change and concern are particularly interesting with regard to our research question: how does the emerging habitus of forestry students play out when it comes to dealing with change?

Discussing impressions of an excursion, the following interview excerpt illustrates the extent of the uncertainty associated with climate change:

“And there we were standing in a completely dead forest. So, there was pine - or there still is in places, but it's drier than anywhere else in Germany. And they have no idea how they're going to get the next generation of forest to grow there any time soon. [...]”

Students see the legacy of previous generations of foresters slowly diminishing and the future appears to be unpredictable. Similar sentiments are expressed in all the interviews. For instance, the statement “the forest is dying” is repeatedly mentioned.

Another section of the interview also shows that the uncertainty does not “only” affect the forest itself and the students' predecessors. It also directly affects the career prospects of the current students who aspire to become foresters:

“Yes, and then on the way home we talked about the fact that we don't even know whether we'll still be dealing with trees to this extent until the end of our professional lives. [...]”

This initially paints a rather bleak picture in terms of future expectations. We see a great extent of uncertainty - both about the forest itself and the professional future of forestry students. Students realize that traditional forestry practices may not be applicable in all forests in the future. This is causing concern among the students, and many feel anxious and distressed about the uncertain future. Some students view climate change as an unsolved problem that they will need to tackle in the future, taking a more neutral stance.

Overall, students develop different strategies and ways of dealing with this omnipresent uncertainty regarding the future of forests and forestry. We have reconstructed three ideal-typical approaches. Not all individual students can necessarily be assigned to a single one of these strategies; rather, some of the students invoke different strategies in different contexts.

1. Optimistic hands-on approach

This approach reflects a preference for practical action. The respective students prefer to boldly throw themselves into action—with the conviction that they can turn things around, even if they cannot see directly where it leads against the backdrop of an uncertain, or at least unknown, future. This is often described in terms like “tackling,” “taking action,” or “hands-on.” There are only few wait-and-see moments in this approach.

2. Trial and error approach

A general imperative to act is also inherent in this second approach. Action should be taken – the big difference is that in this second variant, one first takes a step back. Despite the uncertainty and lack of prospect

one first tries to get as much of an overview of the overall situation as possible. Here, there is much more acknowledgement of the complexity of possibly relevant facts. This also entails a culture of error, in anticipation that things could also go wrong. When that happens, you “gain some distance”, re-evaluate the situation and only then get back into action. Well-considered action is deemed possible; “blind actionism”, as it is sometimes called, is rejected here. This second position therefore entails an awareness and explicit criticism of the first.

3. Frustration despite expertise approach

This approach also contains an imperative for action, although its prospects of success are framed pessimistically. These students see themselves as possessing sufficient knowledge and competence to meet the transformation challenges. However, they see other (non-forestry) actors as a threat to the effectiveness of their actions and measures. It is interesting to note that these actors are not specifically named. They remain vague and are described as “politics” (in general), “processes” (instead of actors), and the like. This may also be due to the elusive global contexts in which the students embed forestry activities.

The students assume that everyone essentially agrees that the forest should be protected, but do not consider “the others” to be competent enough to do “the right thing” despite “goodwill” on all sides. Their chances of saving the forests are being prevented from forces beyond their control. It is precisely this that leads to great frustration and, in some cases, to what is referred to as “environmental depression” (German: “Umweltdepression”), a term used in one of the interviews.

All three approaches show that the students assume the forest can be managed and steered out of the crisis through management – or could be if society at large would not counteract. Based on their studies, they feel competent to contribute to a positive forest future, even in the face of current and future uncertainty.

5. Discussion and conclusion

As we have seen through cultural theories of disciplines and professions, both are defined not only by bodies of scientific knowledge, but also by physical bodies that incorporate beliefs and cultural foundations of such knowledge (the “illusio”, the “tribal” culture). In this line of thinking, we have looked at forest management studies not in terms of formal curricular. Instead, we have reconstructed how students see and feel about their future tasks. We have found a lot of common ground with descriptions of the foresters' habitus in Germany, clearly a role model that many students aspire to. We have also found that students respond strongly to changing times, seeing communication with larger society and dealing with climate change as their major concerns. Many of the interviewees' narrations are arranged around those two themes. At the same time, these accounts provide insights into their identification as (future) foresters, their understanding of learning and legitimate knowledge, and socialization processes during their studies. Also, they are narrations of change and reveal the mis-/matches between persistent habitus and evolving natural and social environments.

Even in the early semesters of their higher education trajectory, students identify as “experts” having access to a more profound knowledge than other social groups, being well equipped for dealing with challenges of forests under the condition of climate change and engaging with other social groups in a hierarchical manner, transferring knowledge to those who know less or for other reasons fail to act on the basis of facts. Their trust in the objectivity of their own professional gaze is high, while they have little confidence in other social groups, in the sense of not expecting to learn much from communication and exchange with non-foresters.

Looking at the strategies that students apply to deal with climate change anxiety, at least two of the three (optimism and ecological depression) are based on an enormous confidence in professional agency – as depressions result from societies' failure to act, and never from

insecurity regarding one's own forest management decisions and potential failures of forestry when managing forests for an unstable future.

This confidence is partly rooted in a largely unchallenged objectivist understanding of scientific knowledge in combination with a strong in-group identity that is reproduced through shared symbols, beliefs, knowledge, and a hierarchical “we/they” - dichotomy in relation to other social groups and professions. Looking to the professional culture in the forestry sector sketched in Section 2, we see the early outlines of a forester's habitus emerge.

Going back to the feminist analysis referenced in Section 2, we find that this professional habitus in the making is clearly connected to gendered notions of nature and (hu)man agency, that are rooted in the modernist myth of control over nature (e.g. Plumwood, 1993; Bourdieu, 2001a; Katz, 2011). It does not follow that persons who define male or female narrate their study experience differently per se. To untangle the complex connections between profession, nature conceptions and gender without reifying gender stereotypes, intersectional perspectives are needed (MacGregor, 2010), that we cannot properly represent based on our sampling and interview choices. However, other studies have shown that forestry institutions are indeed deeply gendered and tend to marginalize female professionals and perspectives both historically and to date.

Based on a range of empirical studies, we have argued that foresters' habitus comes with barriers to transformation (see Section 2, for a gender perspective see Ludvig et al., 2024). And in reverse conclusion, coping with transformation implies challenges for the professional culture: How to adapt not only the forests but also the sector and its people? Managing forests in times of ecological and social upheavals calls for new competencies, such as collaborative capacity, self-reflexivity, emotional intelligence, ambiguity and error tolerance (Künkel et al., 2022; Schneidewind, 2013). In the context of greater changes in education, Sharik et al. (2020) have named similar competencies that are becoming more important on the job market for forestry students, for instance radical interdisciplinarity (pp. 86–87), sense-making, social intelligence, novel and adaptive thinking (p. 88) – competencies that are also associated with transformation literacy and dealing with uncertainty. Leichenko et al. (2022) have pointed to the potential of universities to design learning processes that teach the “how” of transformation.

Forest education research (see Section 2) has pointed out: Forest management curricula still put little emphasis on teaching these skills. In our study, the interviews give evidence that some students do in fact cultivate such personal traits, especially students who follow the “trial and error” strategy. But only few of them have depicted these as building blocks of their professional education or culture. Narrations of becoming a forester tell the story of leaving behind former attitudes that might in fact be helpful to the profession: critical questions, openness to lay perspectives, and emotional reflexivity of one's own relationship with forests. This is also supported by findings from a student survey, conducted in the same project³: This survey indicates a tendency for students' forest-related values to evolve during their studies. There appears to be a gradual shift towards anthropocentric values in relation to biocentric and relational values. Other researchers of the forestry profession have stated similar observations: According to Himes and Dues (2024), relational values and personal feelings towards forests are career motivations for most foresters, but becoming a forester means to “unlearn” much of this (pp. 6–7). Buijs and Lawrence (2013) have portrayed the forest sector as rationalistic to the extent that emotions are completely delegitimized and concealed. Students from our sample that deviated too much from this path to professionalism, ended up seeking careers outside the forestry sector. In the students' initial diversity lies

ample potential for cultivating controversial debates, creative thinking, and collaborative learning across multiple perspectives within the education. Currently however, adaptation pressure towards group cohesion is high.

A number of studies and conceptual papers within forest sciences have argued for shifts in the self-understanding of the discipline and sector that might help to make it more open for transformation, for example through acknowledging contradictions, reflecting normative foundations, and fostering diversity and value plurality (Buijs and Lawrence, 2013; Halla et al., 2023; Himes and Dues, 2024; Katz, 2011; Koch and Tetley, 2023; von Detten, 2022; von Detten and Mikoleit, 2022). This scientific debate has redirected attention to historical contexts, implicit normative and emotional foundations of forestry as a discipline; and the exclusions that follow in their wake. It has also opened up avenues for exploring potential change.

Sustainable forestry came from the concern for optimizing production at the cost of excluding certain uses and people (Himes and Dues, 2024). It follows that new times with their respective ecological and social implications can lead to a mismatch and a need for reinterpretation of the very essence of the discipline. Himes and Dues (2024) see educational curricula as a possible point of intervention, expanding what counts as credible knowledge (including for instance indigenous knowledge) and strengthening competency for critical reflection (p. 10). The authors state that implicit belief systems in forestry, when they are not made explicit and challenged, limit how forestry can become more inclusive and diverse and diminish the potential to adapt and deal with new challenges.

We understand our study as a contribution to recent debates in the social forest sciences. Studies in higher education can illuminate how lay citizens turn into foresters and help understand implicit aspects of forestry's professional culture that students learn to incorporate. The scope of our study is limited to Universities of Applied Sciences that educate forestry practitioners in Germany, using students' narrations as a looking glass into their education. Deeper and more holistic insights into student culture would be gained through longer-term participant observation, as practiced in classical studies on higher education (for instance Becker et al., 1991) or Kaufmann's exploration of the U.S. forest service (Kaufman, 2006). Despite these limits, our study gives new insight into the becoming of foresters and resonates with current research on the profession and its challenges.

As we have shown here by applying theoretical perspectives from higher education research, the binding power of underlying normative assumptions is not mainly transported via curricular activities. To an important extent, it is reproduced in student culture and experienced in subtle ways, as a sense of belonging. In this article, we focused on the reproduction of a professional habitus. Working with Bourdieu, we are of the opinion that sociologists' curiosity for change should not lead them to overlook the more mystifying phenomenon: the stability and persistence of social order, doxa and field logics. With our theoretical heuristics, we are likely to overlook or smoothen out certain aspects, such as the small irritations and transformative potentials that signal shifts within the field. That does not mean there is no change at all: In the face of extreme uncertainties and outside critique, the former doxa cannot be reproduced unquestioningly. A desire for critical debate is growing among students, with heterodox positions (Section 2) also finding their way into the universities and the “forestry bubble”. So far, new ways of thinking (and feeling) are still fragile and precarious. Educational institutions play a crucial role in forming the profession in terms of knowledge, competencies and culture. They have at least some power to attract diverse social groups and, more importantly, to make them feel that they belong and keep them on board.

Previous Submissions

Stephanie Bethmann, Eva Simminger, Jana Baldy, Ulrich Schraml (2018): Forestry in interaction. Shedding light on dynamics of public

³ The final report of the cooperation project is undergoing final review and will be published soon. It will then be available here: <https://projekte.fnr.de/abschlussberichte>.

opinion with a praxeological methodology. <https://doi.org/10.1016/j.forpol.2018.08.005>

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Data statement

Due to the sensitive nature of the questions asked in this study, participants were assured raw data would remain confidential and would not be shared except for anonymized shorter interview excerpts.

CRediT authorship contribution statement

Diana Cichecki: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Hannes Weinbrenner:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Stephanie Bethmann:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Funding acquisition, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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