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Original Research Paper

Seasonal Occurrence and Human Conflict Involving Wild Boar (Sus scrofa cristatus) Across Nine Districts of the Kashmir Valley, 2021–2026

M. Ashraf Bhat[1*], Irfan Gul[2], and M. Farooq Mir[3]

[1]*Design Innovation Centre (DIC), Islamic University of Science and Technology (IUST), Awantipora, J&K- 192122, India*

[2]*Department of Zoology, Government Degree College Shopian, J&K-192303, India*

[3]*Department of Zoology, Islamic University of Science and Technology (IUST), Awantipora, J&K- 192122, India*

mohammad.ashraf@iust.ac.in

Abstract

The Indian wild boar *(Sus scrofa cristatus),* introduced to Kashmir's Dachigam region in the mid-nineteenth century and declared locally extinct by 1984, was rediscovered in Dachigam National Park in 2013 and has since been documented expanding across the Kashmir Valley. This study compiles 22 dated, geolocated photographic and video records of wild boar occurrence and impact across nine districts of the Kashmir Valley such as Shopian, Srinagar, Budgam, Baramulla, Ganderbal, Pulwama, Kulgam, Anantnag, and Bandipora, spanning 2021 to 2026, combining original field photography collected by the authors in Shopian district with source-attributed secondary material compiled from local contacts, social media, and published news reports. Records span five categories: live sightings, agricultural trampling damage, farmer-installed deterrent measures, human-conflict incidents, and one instance of an injured or deceased animal. The compiled records show a pronounced seasonal skew, concentrated in spring and, to a lesser extent, autumn and winter, with no records during summer. We interpret this pattern primarily as a detectability effect linked to seasonal shifts in diel activity and foraging location, whereby wild boar become more nocturnal and forest-interior-foraging when natural food is abundant in summer, and more diurnal and human-adjacent when food is scarce during winter and spring green-up, consistent with seasonal activity patterns reported elsewhere in the Himalayan region and in the broader international literature. This interpretation is further supported by India Meteorological Department data and independent climate reporting showing a sustained sequence of warmer- and drier-than-normal Kashmir winters across the study period, including a record winter precipitation deficit in 2025–26. District-level analysis indicates that reported occurrence and conflict extend well beyond the historically documented Dachigam–Kajinag corridor into peri-urban residential areas, public parks, apple orchards, and paddy-growing districts, with Baramulla and Srinagar districts accounting for the largest number of documented records. As the dataset was compiled opportunistically rather than through standardized, effort-controlled survey methodology, it does not permit calculation of population density, growth rate, or a formal statistical trend; findings are therefore presented descriptively. We identify systematic camera-trap monitoring, genetic-origin analysis, and structured seasonal-activity and farmer-conflict surveys as priority next steps toward a fully quantified regional assessment of wild boar occurrence in Kashmir.

Keywords

Wild boar; Sus scrofa cristatus; Kashmir Valley; multi-district occurrence record; seasonal activity pattern; detectability; human-wildlife conflict; crop damage; climate anomaly; winter precipitation deficit; hangul; South Asia

***Corresponding Author:**

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1. Introduction

1.1 The wild boar as a global ecological generalist

The wild boar (Sus scrofa Linnaeus, 1758) is among the most widely distributed large mammals on Earth, occurring natively or through introduction on every continent except Antarctica (Markov et al., 2022; Barrios-Garcia & Ballari, 2012). This distribution reflects a specific combination of biological traits, dietary omnivory, behavioural flexibility, and a reproductive capacity unusually high for the species' body size, that together explain its success both as a native forest species and, where introduced, as one of the world's most consequential invasive large mammals (Massei & Genov, 2004; Bieber & Ruf, 2005; Lewis et al., 2017).

Taxonomically, Sus scrofa comprises numerous geographically structured subspecies across its Eurasian range. Molecular phylogeographic work has traced a broad pattern of dispersal from South and Southeast Asia into East Asia, Europe, and the Middle East, with several largely independent centers of pig domestication nested within the wider wild lineage (Larson et al., 2005; Choi et al., 2020; Groenen, 2016). The form native to the Indian subcontinent, Sus scrofa cristatus, is distinguished by a coarser, darker coat and a pronounced dorsal bristle crest, and its natural range spans much of peninsular and northern India, though notably not, historically, the enclosed Kashmir Valley (Genov, 1999). This point of nativeness is central to the present study, since the Kashmir population's history diverges sharply from the continuously present, native populations assumed by default in much of the wild boar literature.

1.2 Reproductive biology and demographic recovery potential

Wild boar reproductive biology is distinctive among ungulates for its combination of early sexual maturity, large litter size, and, under favorable conditions, more than one reproductive event annually. Litter sizes ranging from three to over ten piglets have been documented, varying with maternal condition, age, and regional food availability (Fernández-Llario & Mateos-Quesada, 1998; Bywater et al., 2010; Gethöffer et al., 2007). Servanty et al. (2007) further demonstrated adaptive litter sex-ratio adjustment in response to maternal condition, a strategy since corroborated in East Asian populations (Choi et al., 2022). Litter size itself correlates with food availability, including mast crops, and with temperature and precipitation during gestation (Frauendorf et al., 2016). Bieber and Ruf's (2005) elasticity-based population model formalized the demographic implication of this reproductive profile: even a very small founder or remnant population retains the capacity for rapid exponential growth once limiting pressures ease, the theoretical basis for interpreting any wild boar "reappearance" after presumed local extinction, including the Kashmir case discussed below.

1.3 Climate as a determinant of range, abundance, and seasonal behaviour

A substantial literature identifies wild boar as among the clearest large-mammal beneficiaries of a warming climate, primarily through the relaxation of winter severity as a constraint on survival and range. Winter snow cover limiting access to buried food has been repeatedly identified as the principal historical constraint on wild boar density at higher latitudes and elevations (Melis et al., 2006; Geisser & Reyer, 2005). Vetter et al. (2015), in a large multi-decadal European analysis, found population increases strongly associated with milder winters, while Gethöffer et al. (2020) showed that warming winters have altered population age-structure through improved overwinter juvenile survival. This relationship is not uniformly positive across seasons: in Mediterranean contexts, summer heat and drought have been linked to reduced piglet survival and female body condition (Fernández-Llario & Mateos-Quesada, 2005; Fattorini et al., 2024).

Beyond survival, climate and season also structure wild boar behaviour in ways directly relevant to how the species is detected and reported by humans. A Himalayan camera-trap study from Uttarkashi, India, found wild boar activity to be predominantly nocturnal in summer and spring but distinctly more diurnal in winter (Indian Ecological Society, 2023), a shift with direct bearing on human-detection rates independent of any underlying change in population size or density. Complementing this, long-term European crop-damage monitoring shows pronounced and consistent seasonality in wild boar–human interaction, though the precise seasonal pattern varies regionally: central European studies spanning over two decades of monitoring report damage peaking in spring and autumn and lowest in winter, tied to a shifting diet from grasses and cereals in spring to legumes and root crops later in the year; Mediterranean (Sardinian) data instead show peak damage in summer and early autumn with a spring minimum; and Italian rooting-activity studies show peaks in autumn and winter specifically. Taken together, this literature indicates that wild boar–human conflict visibility is not a simple function of underlying abundance but is shaped by season-specific shifts in diet, activity timing, and habitat use, a mechanism directly relevant to interpreting the seasonal pattern documented in the present Kashmir dataset (see Section 3.3).

1.4 Habitat use, diet, and landscape-scale impact

Habitat-selection studies consistently find wild boar favouring dense forest cover while opportunistically exploiting adjacent agricultural land, particularly near forest edges during crop-ripening periods (Thurfjell et al., 2009; Ohashi et al., 2022). Dietary studies confirm plant material, including cultivated crops, constitutes roughly ninety percent of intake across native and introduced ranges (Ballari & Barrios-García, 2014; Schley & Roper, 2003). Beyond direct consumption, the species' rooting behaviour produces substantial indirect ecological effects: Barrios-Garcia and Ballari's (2012) review found rooting disturbance can significantly reduce plant cover and diversity, with cascading effects on associated fauna. At the global scale, McCann et al. (2021) documented that wild pigs threaten 672 taxa across 54 countries, disproportionately species already classified as endangered, a pattern directly relevant to Kashmir's Dachigam National Park, discussed in Section 1.6.

1.5 Global cases of local extinction and recolonization

Kashmir is not the only region where wild boar has vanished and subsequently returned. Sweden provides the most thoroughly quantified comparative case: effectively extinct since roughly the seventeenth century, the species was reintroduced into captive hunting enclosures in the 1940s, with escapes and deliberate releases from the 1970s–1980s establishing free-ranging populations that grew along a logistic trajectory, peaking at an annual harvest of roughly 161,000 individuals by 2020–21 before levelling off (Kruse et al., 2024; Johansson et al., 2026). Swedish policy shifted from eradication to formal native-species recognition only in 1987. Britain presents a parallel case, with wild boar re-establishing in the Weald and the Forest of Dean after an absence of up to seven hundred years, again primarily through captive-farm escapes (Mammal Society, 2024). These cases differ from Kashmir's in one structurally important respect: their recolonization traces to an identifiable anthropogenic mechanism, whereas Kashmir's proposed drivers involve either climate-mediated remnant survival or natural cross-border migration, a comparatively less-studied and, evidentially, currently untested pathway.

1.6 The Kashmir case, Introduction, extinction, and rediscovery

The wild boar is not indigenous to the Kashmir Valley. Historical and departmental accounts attribute its presence to a deliberate mid-nineteenth-century introduction by Maharaja Gulab Singh, the Dogra ruler who acquired Jammu and Kashmir under the 1846 Treaty of Amritsar, for hunting purposes, with Dachigam, today the last substantial stronghold of the critically endangered hangul, serving as the principal introduced range (Kashmir Life, 2023; Kashmir Scan, 2023). Following the end of Dogra rule in 1947, the species received no conservation priority and was administratively regarded as invasive and non-native (Ahmad et al., 2013). By the mid-1980s the population had become rare, and Mansoor (1989) formally documented its local extinction from Dachigam, with no sightings recorded after 1984.

Rediscovery began at the Valley's periphery: a dead specimen was recovered in Lachipora Wildlife Sanctuary in 2010, and the more consequential confirmation followed in April 2013, when researchers surveying for hangul in lower Dachigam sighted a live wild pig, corroborated by camera-trap capture the following month (Ahmad et al., 2013). Subsequent records, Lachipora in 2014, and a 2017 study formally documenting the species across the wider Kajinag Range. confirmed geographic expansion rather than persistence of a single relict group.

1.7 Proposed drivers of resurgence and the Kashmir climate record

Three overlapping hypotheses recur regarding the mechanism of return: climate-driven improvement in overwinter survival; natural migration across the Line of Control from historically contiguous forest in Pakistan-administered Kashmir; and undetected remnant survival within Dachigam throughout the presumed extinction period. None has been empirically tested; no genetic-origin study comparable to Johansson et al.'s (2026) analysis of Swedish wild boar has been undertaken for the Kashmir population.

The climate hypothesis, however, now has direct meteorological support spanning the present study's timeframe. India Meteorological Department data and independent climate analyses document a sustained sequence of below-normal winter precipitation in Kashmir across the entire 2021–2026 study period, with deficits estimated at roughly 28 percent (2021–22), 16 percent (2022–23), and 7 percent (2023–24), before intensifying sharply: the 2024–25 winter was among the driest on record for its date, and December 2025–February 2026 recorded a 65 percent precipitation deficit against the long-term normal, the seventh consecutive deficient winter, accompanied by weekly mean maximum-temperature anomalies as high as +5.6°C and February readings 9–11°C above normal at Srinagar (Down To Earth, 2026; Rising Kashmir, 2025; Countercurrents, 2026; IMD Srinagar weekly reports). This documented, multi-year warming-and-drying trend is directly consistent with the winter-mortality-relaxation mechanism established in the international wild boar literature.

1.8 Ecological stakes: hangul and beyond

The resurgence carries particular ecological weight because Dachigam remains the last substantial

stronghold of the hangul (Cervus hanglu hanglu), critically endangered and confined largely to the park's 141 km² extent, where recorded hangul density (~5.11 individuals/km²) and leopard density (among the lowest recorded nationally) indicate an ecosystem already under resource constraint. A 2022–23 departmental assessment comparing wild boar and hangul food habits concluded that a growing boar population risks disrupting Dachigam's broader ecology, with subsequent findings indicating boar rooting has reduced herbaceous ground cover by 80–90 percent in high-density areas.

1.9 The present study's contribution

Existing published literature on Kashmir's wild boar resurgence remains concentrated on Dachigam and the Kajinag Range, with human-conflict reporting largely confined to isolated, high-profile incidents. What has not yet been assembled is a dated, multi-district, photographically documented record spanning several years, examined for seasonal pattern and linked to the region's specific climate record. This study addresses that gap directly: drawing on original field photography from Shopian district together with source-attributed secondary material from eight further districts, it compiles 22 dated records of wild boar occurrence, agricultural damage, deterrent response, and human conflict across the Kashmir Valley between 2021 and 2026.

2. Materials and Methods

2.1 Study area

This study covers the Kashmir Valley, Union Territory of Jammu and Kashmir, India, encompassing nine districts in which wild boar records were compiled: Shopian, Srinagar, Budgam, Baramulla, Ganderbal, Pulwama, Kulgam, Anantnag, and Bandipora. Dachigam National Park, in Srinagar district, forms the historically documented core of the species' nineteenth-century introduction and 2013 rediscovery, and serves as the geographic reference point against which range expansion is assessed.

2.2 Data sources and evidentiary tiers

Records were compiled from three distinct source tiers, maintained separately to preserve methodological transparency. Tier 1, Primary field data: photographic records collected directly by the authors in Shopian district between September 2025 and January 2026 (n = 2). Tier 2, Secondary, author-compiled material: photographic and video material obtained by the authors from local contacts and social media circulation across eight further districts (n = 14). Tier 3, Independently retrieved published literature: records identified through the authors' systematic search of regional news archives, used to corroborate and extend the Tier 1 and Tier 2 dataset (n = 6).

2.3 Evidence classification

Records were sorted into five non-exclusive categories: live sightings; agricultural damage; farmer deterrent or adaptation measures; human-conflict incidents; and records of an injured or deceased animal.

2.4 Seasonal and climatic analysis

Each record's date was assigned to a meteorological season (winter: December–February; spring: March–May; summer: June–August; autumn: September–November). Corresponding winter climate data for Kashmir across the study period were compiled from India Meteorological Department weekly and seasonal reports and independent climate-reporting sources, used solely to contextualize the compiled dataset's seasonal distribution and not to establish a direct statistical or causal test.

2.5 Data quality control

Each image was reviewed to confirm the depicted animal was morphologically consistent with wild boar; one candidate record was excluded following review, as the animals depicted were more consistent with domestic livestock. Records lacking a specific, corroborated date or locality were flagged as provisional. Material depicting identifiable injured individuals, including one image of an identifiable injured minor, was excluded from reproduction or descriptive use on ethical grounds, given the absence of verifiable consent; the corresponding incident is described only in aggregate, non-identifying terms.

2.6 Figure reproduction policy

Only photographs to which the authors hold direct reproduction rights (Tier 1, primary field data) are reproduced as figures in this manuscript. All other records (Tiers 2 and 3) are described from author field notes and compiled documentation in the tables and text below but are not reproduced as images, in the absence of confirmed reproduction permission from the original photographer, contact, or publishing outlet.

2.7 Limitations of the sampling approach

This study does not employ a standardized, effort-controlled survey design. Records were compiled opportunistically, contingent on the authors' field access, social circulation, and press coverage. The dataset cannot support calculation of population density, abundance, or growth rate; apparent temporal or geographic clustering may reflect variation in reporting behaviour rather than underlying variation in boar activity; and the observed seasonal distribution reflects detected and reported occurrence, not directly measured activity level.

2.8 Comparative framework

Findings are compared descriptively against published quantitative data from Sweden (Kruse et al., 2024; Johansson et al., 2026) and Britain (Mammal Society, 2024), used to illustrate the scale of systematic

monitoring required to move the Kashmir case from a descriptive to a quantified evidence base.

3. Results

A total of 22 dated, geolocated records of wild boar occurrence and impact were compiled across nine districts of the Kashmir Valley for the period 2021–2026, drawn from three evidentiary tiers: primary author-collected field photography (n = 2), secondary author-compiled material (n = 14), and independently retrieved published news reports (n = 6).

Table 1. *Full record inventory*

S. No.	District	Locality	Date	Season	Category	Tier
1	Shopian	Hajinpora	19.01.2026	Winter	Sighting	Primary
2	Shopian	Unspecified	27.09.2025	Autumn	Sighting	Primary
3	Baramulla	Public park	11.09.2021	Autumn	Sighting	Secondary (compiled)
4	Baramulla	Rafiabad	19.12.2024	Winter	Sighting	Secondary (compiled)
5	Baramulla	Baramulla–Handwara High way	31.08.2023	Aug/Sep boundary	Sighting (unconfirmed)	Secondary (compiled)
6	Baramulla	Unspecified	26.05.2023	Spring	Deterrent measure	Secondary (compiled)
7	Baramulla	Unspecified	26.05.2023	Spring	Deterrent measure	Secondary (compiled)
8	Ganderbal	Babispora	16.03.2022	Spring	Sighting	Secondary (compiled)
9	Ganderbal	Unspecified	18.03.2022	Spring	Sighting	Secondary (compiled)
10	Srinagar	Dal Lake/Boulevard	07.10.2024	Autumn	Sighting	Secondary (literature)
11	Srinagar	Dalgate	09.10.2024	Autumn	Sighting/capture	Secondary (literature)
12	Srinagar	Tulip & Botanical Garden	25.10.2024	Autumn	Sighting	Secondary (literature)
13	Srinagar	New Theed village	28.03.2026	Spring	Policy record	Secondary (literature)
14	Srinagar	90 ft Road	05.04.2026	Spring	Sighting	Secondary (literature)
15	Srinagar	Ellahi Bagh housing colony	28.05.2026	Spring	Sighting	Secondary (compiled)
16	Budgam	Chadoora (4 villages)	25-27.04.2026	Spring	Trampling	Secondary (literature)
17	Budgam	Wathoora, Chadoora	Date TBC	TBC	Trampling	Secondary (compiled)
18	Budgam	Wathoora, Chadoora	2025/26 TBC	TBC	Sighting	Secondary (compiled)
19	Bandipora	Sumbal, Sonawari	26.04.2026	Spring	Trampling	Secondary (compiled)
20	Pulwama	Tral (market)	17.01.2026	Winter	Human conflict	Secondary (compiled+lit.)
21	Kulgam	Unspecified	22.01.2024	Winter	Human conflict	Secondary (compiled)
22	Anantnag	Liver, Pahalgam	27.04.2023	Spring	Injured/dead animal	Secondary (compiled)

Note: Record #5 could not be visually confirmed as depicting wild boar and is excluded from the seasonal analysis in Table 3., Date TBC stands for Date to be confirmed.

Table 2. *District-Level Summary*

District	Total records	Sightings	Trampling	Deterrent	Conflict	Other

Srinagar	6	5	0	0	0	1 (policy)
Baramulla	5	3	0	2	0	0
Budgam	3	1	2	0	0	0
Shopian	2	2	0	0	0	0
Ganderbal	2	2	0	0	0	0
Bandipora	1	0	1	0	0	0
Pulwama	1	0	0	0	1	0
Kulgam	1	0	0	0	1	0
Anantnag	1	0	0	0	0	1 (injured/dead)
Total	22	13	3	2	2	2

Table 3. *Seasonal Distribution and Kashmir Winter Climate Context (2021–2026)*

Season	**Records (n=20–21)**	**Corresponding winter climate anomaly**
Winter (Dec–Feb)	4	Precipitation deficits every winter: ~28% (2021–22), ~16% (2022–23), ~7% (2023–24); 2024–25 among driest on record; 65% deficit in 2025–26 (7th consecutive deficient winter). Temp. anomalies up to +5.6°C weekly mean (Jan 2026)
Spring (Mar–May)	10	Follows winters with above deficits; Feb 2026 readings 9–11°C above normal at Srinagar
Summer (Jun–Aug)	0	Not applicable
Autumn (Sep–Nov)	6	Not directly linked to winter data; contextual only

Spring accounts for 48% of confirmed seasonal records (10/21), autumn 29% (6/21), winter 19% (4/21), summer 0%.

Table 4. *Evidence Category Breakdown*

Category	**Count**	**% of total (n=22)**
Live sighting	13	59%
Agricultural trampling	3	14%
Farmer deterrent measure	2	9%
Human-conflict incident	2	9%
Injured/dead animal	1	5%
Policy/administrative record	1	5%

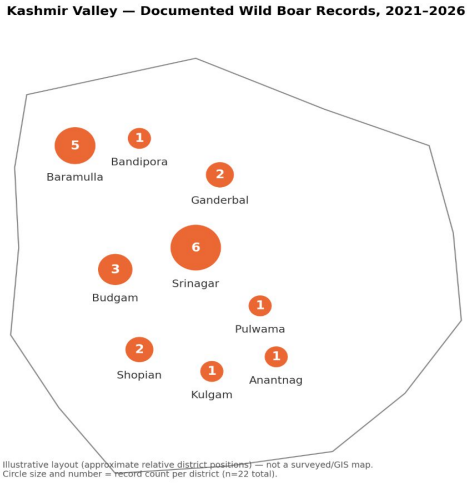
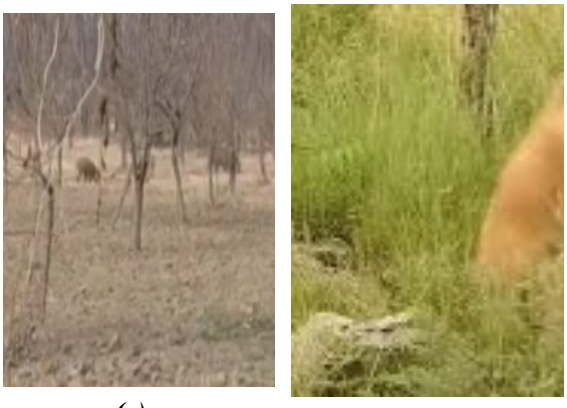


Figure 1. *Illustrative distribution of documented wild boar records (n=22) across nine districts of the Kashmir Valley, 2021–2026. Layout is illustrative and not a surveyed/GIS map.*



(a) ***(b)***

Figure 2. *Primary field photographs of wild boar (Sus scrofa cristatus), Shopian district. (a) Hajinpora, 19 January 2026. (b) Shopian district, 27 September 2025. Photographs: authors.*

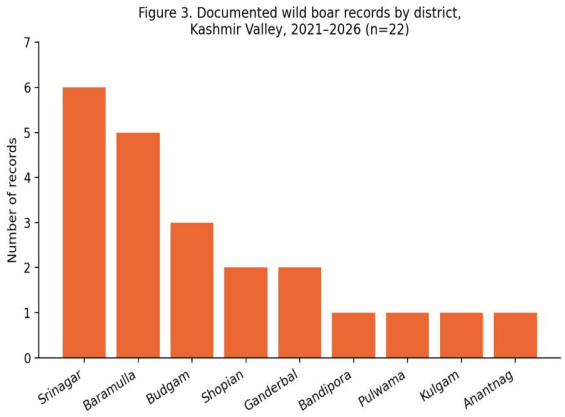


Figure 3. *Documented wild boar records by district, Kashmir Valley, 2021–2026 (n=22).*

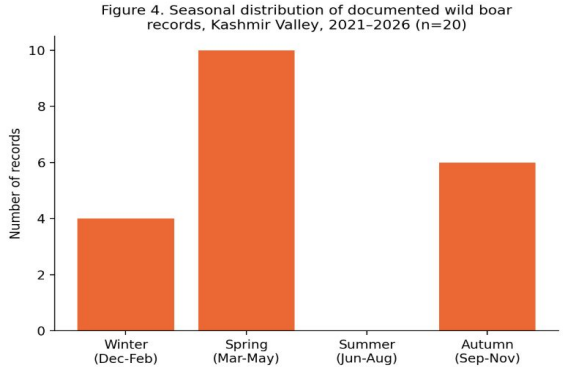


Figure 4. *Seasonal distribution of documented wild boar records, Kashmir Valley, 2021–2026 (n=20).*

4. Discussion

4.1 Interpreting the combined evidence base

The dataset compiled in this study, 22 dated records spanning nine districts, three evidentiary tiers, and five categories of occurrence and impact, represents, to our knowledge, the first attempt to assemble Kashmir's scattered wild boar record into a single, geographically and temporally structured picture. Nine districts, spanning the Valley's northwest (Baramulla), north (Bandipora, Ganderbal), centre (Srinagar, Budgam), and south (Shopian, Pulwama, Kulgam, Anantnag), indicates that wild boar presence is no longer confined to the historically documented Dachigam–Kajinag corridor described in earlier published accounts.

The distribution across evidence categories, sightings dominating (59%), followed by trampling, deterrent measures, and conflict incidents in roughly similar proportions, suggests that the wild boar's footprint in Kashmir is not confined to a single type of impact. The presence of farmer deterrent measures specifically is worth dwelling on, since it captures anticipatory economic behavior: a farmer who installs fencing or a scarecrow effigy before any damage has occurred is responding to a perceived risk, not a realized loss, a cost that does not appear in any crop-damage compensation ledger, yet is a real burden imposed by the species' expanding range.

4.2 The detectability mechanism: why zero summer records does not mean absence

The Himalayan camera-trap evidence from Uttarkashi, showing wild boar shifting from nocturnal activity in summer and spring toward markedly more diurnal behavior in winter, offers the most direct explanatory bridge between the global literature and this dataset's summer gap. If Kashmir's boar population follows a broadly similar diel pattern, a complete absence of summer sightings would be expected almost regardless of population size, simply because summer-active boar is moving under cover of darkness and through forest interior, where casual human observation and reporting are structurally less likely to capture them.

The spring peak fits within the same framework but through a different mechanism. The Central European crop-damage literature identifies spring as a period when boar target fresh grasses, green shoots, and newly sown fields, precisely the paddy-seedbed and orchard-adjacent damage recorded in this dataset's Budgam, Bandipora, and Baramulla entries. Spring in Kashmir also follows directly on from the region's now-consistently precipitation-deficient winters; reduced snowpack and earlier snowmelt plausibly shorten the period during which natural forage remains buried or inaccessible, potentially compressing and intensifying spring foraging pressure on cultivated land.

4.3 The Kashmir climate record as corroborating, not conclusive, evidence

The IMD-sourced climate data compiled in this study is, we believe, a genuine contribution: to our knowledge, no prior published account of Kashmir's wild boar resurgence has set the phenomenon against a dated, multi-year meteorological record. That every winter across the 2021–2026 study period recorded a precipitation deficit, intensifying sharply toward a 65 percent shortfall in 2025–26, situates the climate-driver hypothesis on firmer empirical ground than it has previously had. However, this study's design does not permit a formal statistical test of the relationship between year-to-year climate anomalies and sighting frequency; the apparent correlation could equally reflect increasing smartphone and social media penetration or growing press attention. We present the climate record as consistent with the mechanism proposed in the international literature, not as proof of a direct causal link.

4.4 Situating Kashmir within the global recolonization literature

Sweden's documented trajectory, from a few escaped animals in the 1970s–80s to a logistic growth curve peaking at 161,000 animals harvested annually by 2020–21, took roughly four decades to fully manifest. Kashmir's rediscovery dates to 2013, roughly thirteen years before the present study; if a broadly comparable trajectory is underway, this dataset may be capturing the middle, still-accelerating phase of a longer recolonization process. The mechanistic contrast remains important: Sweden and Britain's recolonizations trace to captive-enclosure escape, whereas Kashmir's proposed mechanisms remain genuinely untested. Only genetic sampling, following the precedent set by Johansson et al. (2026), can settle whether Kashmir's boar represent a genuinely distinct recolonization event or a previously undetected continuity.

4.5 Priority studies required

Four categories of future research are identified as necessary next steps: (i) systematic, repeated camera-trap and transect surveys across all nine identified districts to establish genuine population and density estimates; (ii) genetic sampling of Kashmir's wild boar population, compared where feasible against populations in Pakistan-administered Kashmir; (iii) structured, seasonally stratified camera-trap or radio-telemetry studies specifically targeting diel activity patterns to test the detectability mechanism directly; and (iv) structured household and farmer surveys capturing both realized crop losses and preventive expenditure.

4.6 Final reflection

Taken together, this study's contribution is best understood as establishing scope and plausibility rather than proof. It demonstrates that wild boar occurrence and conflict in Kashmir are geographically far more widespread than the existing Dachigam-centered literature has documented; it offers a literature-grounded, testable explanation for the pronounced seasonal pattern observed; and it grounds the long-standing climate-driver hypothesis in dated meteorological data for the first time. What it cannot do is establish population trend or confirm the mechanism of the species' original return, gaps that, more than any single finding in this dataset, define the paper's central message and the priority for future work.

5. Conclusion

This study compiled 22 dated, multi-district photographic and video records documenting wild boar (Sus scrofa cristatus) occurrence, agricultural impact, farmer adaptation, and human conflict across nine districts of the Kashmir Valley between 2021 and 2026. The findings indicate that the species' range, previously documented primarily within the Dachigam–Kajinag corridor, now extends into peri-urban settlements, apple orchards, and paddy-growing districts across the Valley. The dataset's pronounced spring-weighted, summer-absent seasonal distribution is interpreted through a detectability mechanism grounded in the international and regional Himalayan literature on wild boar diel activity, and is further contextualized against a documented, IMD-sourced sequence of increasingly warm and precipitation-deficient Kashmir winters across the study period. As an opportunistically compiled, non-systematic dataset, these findings establish scope and plausibility rather than a quantified population trend. Systematic camera-trap monitoring, genetic-origin analysis, and structured seasonal-activity and farmer-conflict surveys are identified as the necessary next steps toward a fully quantified regional assessment, and toward resolving the still-open question of how Kashmir's wild boar population came to reappear after three decades of presumed local extinction.

6. Acknowledgements

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