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Implementation of India's Integrated Child Development Services and maternal and child health practices in a tribal district of Assam: A mixed- methods study

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Abstract

Background

India’s Integrated Child Development Services (ICDS) is a nationwide programme designed to improve maternal and child health through supplementary nutrition, growth monitoring, and community-based counseling. Despite programme expansion, disparities persist in tribal regions. This study examines maternal and child health practices among Adivasi communities in Gossaigaon, Assam, and evaluates how frontline implementation of ICDS influences service utilisation and health behaviours.

Methods

A mixed-methods ethnographic design was employed between July 2023 and December 2025 in villages covered under the Gossaigaon ICDS Project. A household survey was conducted among 127 mothers of children aged 0–6 years to assess antenatal care, place and type of delivery, contraceptive use, and infant feeding practices. Qualitative data were collected through participant observation, semi-structured interviews with 20 Anganwadi Workers (AWWs), ASHAs, ANMs, supervisors, and case documentation. Quantitative data were analysed using descriptive statistics, and qualitative materials were thematically analysed and triangulated across data sources.

Results

Institutional delivery was widely reported, with the majority of births occurring in government or tea garden health facilities. Early initiation of breastfeeding within 24 hours was observed in 72.9% of recorded cases. Long-acting reversible contraception, particularly intrauterine devices (45.7%), was commonly used, while condom use was absent. Growth monitoring and referral mechanisms enabled identification of malnourished children, although initial resistance to referral was documented. Traditional postpartum dietary practices and herbal applications coexisted with biomedical care. Anganwadi Workers played a critical role in counseling, referral facilitation, and sustaining trust between households and the health system.

Conclusions

ICDS implementation in this tribal setting is associated with improvements in institutional delivery, early breastfeeding, and contraceptive uptake. However, programme effectiveness depends substantially on frontline relational work and culturally embedded mediation. Strengthening support systems for community health workers, promoting male engagement in reproductive health, and improving referral logistics may enhance sustainability of maternal and child health gains in marginalized regions.

Plain language summary

In Gossaigaon, Anganwadi centres have helped increase hospital births, immunization, and early breastfeeding. Still, many families combine traditional care (massage, herbal cord pastes, postpartum

foods) with clinic visits. The success of ICDS relies heavily on local Anganwadi Workers, who act as trusted mediators between the state and village life.

Introduction

India's Integrated Child Development Services (ICDS), launched in 1975, represents one of the world's largest community-based platforms for addressing child undernutrition, maternal health, and early childhood development. Through supplementary nutrition, growth monitoring, preschool education, health counseling, and referral linkages, the programme seeks to interrupt intergenerational cycles of deprivation (Kapil, 2002; NITI Aayog, 2020). Recent initiatives, including the POSHAN Abhiyaan and digital tracking systems such as ICDS-CAS and the Poshan Tracker, aim to strengthen accountability, convergence, and real-time monitoring of beneficiaries (MWCD, 2018; PIB, 2018).

National indicators show gradual improvements in institutional deliveries, immunisation coverage, and early initiation of breastfeeding. However, these aggregate gains conceal persistent disparities in tribal and geographically remote regions. In such settings, poverty, fragile transport networks, livelihood demands, and culturally embedded understandings of pregnancy and care continue to influence whether and how families engage with services (George Institute, 2024; Pramanik et al., 2018). The mere presence of infrastructure does not guarantee utilisation; implementation unfolds within complex social worlds.

Research on policy implementation emphasises that frontline actors are pivotal in shaping outcomes. Rather than functioning as mechanical transmitters of state directives, they interpret, adapt, and prioritise interventions according to local realities — a process widely conceptualises **street-level bureaucracy** (Lipsky, 1980). In maternal and child health programmes, the success of counseling, referral, and behaviour change frequently depends on relationships of trust built through repeated interaction.

Anthropological scholarship further demonstrates that biomedical expansion rarely displaces pre-existing therapeutic traditions. Communities often combine multiple forms of knowledge and treatment in what has been termed **medical pluralism** (Leslie, 1980; Lock & Nguyen, 2018). Public health interventions therefore operate most effectively when they negotiate coexistence rather than demand replacement.

At the same time, feminist analyses of care warn that welfare systems commonly depend on women's labour while leaving gendered divisions of responsibility largely intact (Tronto, 1993; Razavi, 2007). Identifying who absorbs the work of compliance is crucial for understanding both effectiveness and equity.

Taken together, these perspectives suggest that ICDS should be examined not only through service statistics but also through the everyday social relations that make programmes credible and actionable.

Understanding how families interpret advice, how resistance is managed, and how frontline workers sustain legitimacy is essential for evaluating real impact.

Study Setting and Research Focus

Gossaigaon subdivision, located in Kokrajhar district within the Bodoland Territorial Region, comprises tea garden labour lines, forest-fringe villages, and small agrarian settlements. The local Integrated Child Development Services project, established in 1997, operates through 224 Anganwadi centres distributed across nine administrative sectors and serves a socially diverse population that includes Santhal, Bodo, Rajbongshi and other communities. Service provision unfolds across dispersed habitations, variable transport access, and multilingual environments, all of which shape communication, mobility, and utilisation of care.

Within this setting, Anganwadi centres represent critical interfaces between households and the welfare state. They are sites where supplementary nutrition, growth surveillance, preschool activities, and maternal counseling are delivered amid existing hierarchies of age, gender, and kinship, as well as religious and livelihood commitments. Because these interactions occur in everyday village life, the processes through which programme directives are accepted, reinterpreted, or delayed become especially visible.

Against this backdrop, the study aims to examine how maternal and child health services under ICDS are interpreted, negotiated, and enacted within Adivasi households in Gossaigaon, with particular attention to the mediating role of Anganwadi Workers. Specifically, it addresses the following questions:

(i) How are decisions regarding pregnancy, childbirth, and infant care shaped by household authority, social relations, and engagement with ICDS services?

(ii) How do families integrate biomedical advice with existing cultural knowledge and practices related to maternal and newborn health?

(iii) In what ways do Anganwadi Workers translate programme mandates into locally acceptable forms of care and mobilize participation?

By addressing these questions, the study seeks to clarify the social processes through which public health policy becomes actionable in a marginalized rural setting.

[Insert Figure 1 here]

Contribution

By combining ethnographic depth with descriptive health indicators, the paper contributes to growing efforts to understand maternal and child health implementation as a relational process. It argues that programme success in tribal settings depends fundamentally on culturally embedded mediation

performed by frontline women workers, whose labour often remains invisible in quantitative assessments.

Methods

Study design and participants

This study adopted a mixed-methods ethnographic design integrating qualitative field inquiry with descriptive quantitative analysis of maternal and child health indicators. Fieldwork was conducted between July 2023 and December 2025 in Adivasi villages covered under the Gossaigaon Integrated Child Development Services (ICDS) Project in Kokrajhar district, Assam.

The research investigated how maternal and child health care is practised at the household level and how frontline workers—especially Anganwadi Workers (AWWs)—mediate the implementation of state welfare interventions. The study population consisted primarily of mothers of children aged 0–6 years, pregnant and lactating women, Anganwadi Workers, Accredited Social Health Activists (ASHAs), Auxiliary Nurse Midwives (ANMs), supervisors, and community elders.

A total of 127 mothers participated in the household survey component. The survey sample represented mothers available within selected Anganwadi centre catchment areas during the study period and was intended to generate descriptive community-level health indicators rather than population-level statistical inference. Sample size adequacy was supported through triangulation with qualitative data collected across multiple villages and frontline worker networks.

For qualitative exploration, purposive sampling was used to identify participants who were actively engaged with ICDS services, including women with recent delivery experiences, families of malnourished children, and beneficiaries attending Village Health Sanitation and Nutrition Days (VHSNDs). Frontline workers were selected across different sectors of the project to capture variation in geography, ethnicity, and access conditions.

Rather than treating programme uptake as an automatic effect of service availability, the design aimed to understand how utilisation is shaped through everyday negotiations embedded in kinship structures, gendered responsibilities, economic limitations, and culturally grounded ideas of care, risk, and wellbeing.

Data collection

Data were collected through multiple complementary techniques, including structured household surveys (Supplementary File 1), participant observation, semi-structured interviews, and case documentation to ensure methodological triangulation.

Household survey

A structured household survey questionnaire was administered to 127 mothers of children aged 0–6 years to collect information on socio-demographic characteristics, antenatal care utilisation, delivery practices, contraceptive behaviour, infant feeding, and postnatal care practices. The questionnaire was developed specifically for this study based on Integrated Child Development Services (ICDS) monitoring indicators and maternal and child health variables used in national surveys such as the National Family Health Survey (NFHS). The English-language version of the survey instrument is provided as **Supplementary File 1**. These data form the basis of the statistical tables presented in the Results.

Participant observation

Sustained participant observation was carried out in several Anganwadi centres. The researcher attended routine preschool education sessions, growth monitoring activities, supplementary nutrition distribution, Village Health Sanitation and Nutrition Days (VHSNDs), community-based events such as Annaprashan and Suposan Diwas, and sector review meetings. Field notes documented interactions between Anganwadi Workers (AWWs) and beneficiaries, counselling practices, negotiation of refusals, and everyday administrative work, including digital reporting requirements.

Interviews

Semi-structured interviews were conducted with 20 Anganwadi Workers, five Lady Supervisors, six Accredited Social Health Activists (ASHAs), four Auxiliary Nurse Midwives (ANMs), and community elders and members of mothers' groups. Interviews explored perceptions of pregnancy care, institutional delivery, nutrition counselling, barriers to service utilisation, gender roles, and experiences of programme implementation.

Case studies

Specific events illustrating programme dynamics were documented in depth as case studies. These included emergency obstetric referrals, identification and transfer of severely malnourished children to Nutritional Rehabilitation Centres, and counselling encounters in which families initially resisted biomedical advice.

Data analysis

Quantitative data from the household survey were entered into spreadsheets and analysed using descriptive statistics, primarily frequencies and percentages, to illustrate patterns of institutional delivery, contraceptive choice, and infant feeding behaviour.

Qualitative materials—including interviews, observations, and case documentation—were transcribed and organised thematically. Analysis followed an iterative coding process identifying recurrent domains such as decision-making authority within households, negotiation between traditional and biomedical practices, perceptions of risk, labour and economic constraints, trust in frontline workers, and administrative and digital accountability.

Triangulation across multiple data sources, including survey responses, observations, interviews, and project records, enhanced analytical reliability and enabled comparison between reported behaviour and observed practice.

Integration of quantitative and qualitative findings occurred during interpretation through a convergent mixed-methods approach, whereby survey patterns were contextualised using ethnographic observations, interview narratives, and documented case experiences. This approach enabled statistical trends to be interpreted in relation to social decision-making processes and frontline implementation dynamics.

Ethical procedures during fieldwork

The study adhered to standard ethical principles for research involving human participants. Prior to participation, respondents were informed about the purpose of the research, voluntary nature of involvement, confidentiality safeguards, and their right to withdraw at any time.

Results

Profile of respondents

A total of 127 mothers participated in the household survey. No respondents reported childbirth below the age of 19 years. The largest proportion of mothers were concentrated in the 20–29 year age range, together accounting for 36.2% of the sample. Representation gradually declined across higher age groups, although a small cohort of older mothers above 55 years (11.8%) remained present in extended households and often played advisory roles in pregnancy and childcare decisions.

[Insert Table 1 here]

Age group (years)	N	%
<19	0	0.0
20–24	22	17.32
25–29	24	18.90
30–34	17	13.39
35–39	16	12.60
40–44	12	9.45
45–49	11	8.66
50–54	10	7.87
≥55	15	11.81
Total	**127**	**100.00**

Table 1. Distribution of mothers by age group (n=127)
(Values taken from field dataset; percentages rounded.)

(Source: field survey).

The age structure indicates that no respondents reported adolescent child birth and socially sanctioned marriage patterns rather than adolescent pregnancy.

Conception and pregnancy recognition

Most women reported that pregnancy was suspected after a missed menstrual cycle and increasingly confirmed through home pregnancy test kits or at nearby health facilities. Consultation with ASHAs or AWWs usually followed confirmation.

Women described early symptoms such as weakness, nausea, and dizziness, and many associated these with the need for dietary strengthening. Although biomedical advice emphasised iron, protein, and regular monitoring, household decision-making around food continued to involve mothers-in-law and senior female relatives.

Monthly antenatal visits were common among women residing closer to roads or tea garden hospitals, whereas those in interior settlements reported irregular attendance during monsoon periods or peak agricultural seasons.

Place of delivery

Institutional childbirth has become the norm in the study area. Of the 127 reported births:

[Insert Table 2 here]

Place of delivery	**n**	**%**
Government Hospital	32	25.1
Home	21	16.5
Total	**127**	**100.00**
Type of delivery	**n**	**%**
Normal	81	63.8
Caesarean	46	36.2
Total	**127**	**100.0**

Table 2. Place and type of delivery (n=127)

(Source: field survey)

- 25.1% in government hospitals
- 16.5% at home

Together, more than four out of five deliveries took place in health facilities.

Families cited availability of trained personnel, ambulance access, and financial incentives as key motivations. However, home births persisted among households facing transport difficulties or where elder women preferred familiar surroundings and traditional support.

Type of delivery

Normal vaginal delivery accounted for 63.8% of cases, while 36.2% (See Table 2) involved caesarean sections. Although surgical birth was accepted when advised by doctors, several families expressed concern about recovery time and future work capacity.

Nonetheless, women who experienced complications emphasised that institutional care was lifesaving, and such experiences circulated widely within community narratives, reinforcing hospital preference.

Abortion practices

Knowledge of herbal and traditional abortifacient methods was reported, yet an observable shift toward medically supervised termination emerged, particularly among couples who had achieved desired family size. ASHAs frequently acted as referral guides in these situations.

Contraceptive use

Long-acting and hormonal methods dominated contraceptive behaviour:

[Insert Table 3 here]

Method	n	%
IUD	58	45.66
Pills	41	32.28
Traditional (withdrawal)	28	22.04
Condoms	0	0.0
Total	**127**	**100.0**

Table 3. Contraceptive methods (n=127).

(Source: field survey)

- 45.7% reported intrauterine device use
- 32.3% used oral pills
- 22.0% relied on withdrawal
- no respondents reported condom use

No respondents reported condom use. Women described themselves as primarily responsible for contraception.

Postnatal recovery

Postpartum care combined biomedical advice with long-standing domestic traditions. Women were encouraged to rest, consume warm foods, and take herbal preparations believed to restore strength and enhance lactation. Senior women supervised bathing, diet, and activity restrictions.

Home visits by AWWs or ASHAs occurred, especially in the first weeks after delivery, focusing on breastfeeding, immunization schedules, and maternal nutrition.

Infant care practices

Immediately after birth, newborns were commonly swaddled and massaged. In some

households, turmeric or neem-based substances were applied near the umbilical region, even when delivery occurred in a hospital.

[Insert Table 4 here]

Initiation time	n	%
Immediately after birth	43	27.0
Within 24 hours	116	72.9
Total	**159**	**100.0**

Table 4. Breastfeeding initiation (n=159 children surveyed in file)

(Source: field survey)

Breastfeeding practices showed strong alignment with public health messaging. Among 159 children recorded in project registers, 72.9% were breastfed within the first 24 hours, and 27% immediately after birth. Mothers attributed early initiation to repeated counselling during pregnancy and reminders from AWWs.

Identification and referral of malnutrition

Growth monitoring at Anganwadi centres enabled identification of children with low weight or mid-upper arm circumference. In one documented instance, a severely malnourished child was referred to the Nutritional Rehabilitation Centre despite initial maternal resistance. Continuous persuasion, assurance of compensation, and involvement of multiple frontline workers facilitated compliance. The child returned with improved weight and health.

Everyday functioning of ICDS

Anganwadi centres operated as distribution points, preschool spaces, counselling venues, and meeting grounds for women. Community Based Events and VHSNDs served as major occasions for disseminating nutrition information, registering pregnancies, and updating immunization status.

The credibility of these activities depended heavily on the interpersonal reputation of AWWs. Beneficiaries frequently described them as approachable figures who understood local circumstances.

Discussion

This study examined how maternal and child health interventions under ICDS are enacted within Adivasi communities in Gossaigaon. While quantitative indicators demonstrate important shifts toward institutional delivery, early breastfeeding initiation, and increased use of modern contraception, ethnographic findings reveal that these outcomes are achieved through continuous negotiation embedded in kinship relations, gender hierarchies, and local moral worlds. Policy, in other words, is not simply implemented; it is socially produced.

From programme delivery to everyday governance

Conventional evaluations of ICDS emphasize enrolment figures, nutritional grades, or service coverage. Such metrics are crucial, yet they often obscure the human processes that make delivery possible. At the village level, welfare governance depends on frontline workers who interpret rules, prioritise cases, and persuade families.

This dynamic corresponds closely to the idea of street-level bureaucracy, where public servants exercise practical judgement while translating state mandates into locally workable actions (Lipsky, 1980). Anganwadi Workers in Gossaigaon routinely adapt biomedical advice to family circumstances, seasonal labour demands, and interpersonal sensitivities. Their authority is therefore relational rather than purely administrative.

The implication is that improvements in maternal and child health cannot be understood without analysing how discretion, negotiation, and trust shape everyday encounters.

Medical pluralism and layered protection

The persistence of herbal applications, ritual observances, massage, and postpartum dietary regimes alongside hospital care illustrates what medical anthropologists have long termed medical pluralism (Leslie, 1980; Lock & Nguyen, 2018). Families do not perceive indigenous and biomedical systems as mutually exclusive. Instead, each addresses different dimensions of vulnerability—physical, spiritual, and social.

From this perspective, the continued use of traditional practices is not necessarily resistance. It may represent a strategy of risk diversification. Attempts by programmes to delegitimize these practices entirely can threaten cooperation, whereas respectful accommodation may enhance uptake of lifesaving interventions.

The high rate of institutional delivery observed in this study, combined with survival of ritual practices, suggests precisely such coexistence.

Gendered responsibility and partial transformation

Despite expanded services, contraceptive responsibility remains overwhelmingly borne by women. The absence of condom use indicates limited male participation, echoing broader evidence that reproductive governance often intensifies women's bodily obligations even while claiming empowerment. The burden of fertility regulation thus remained overwhelmingly feminized. Discussions with women suggested that male reluctance, embarrassment, and entrenched norms of masculinity limited adoption of barrier methods.

Feminist scholars of care argue that welfare programmes frequently rely on women's unpaid or under-recognised labour to function effectively (Tronto, 1993; Razavi, 2007). In Gossaigaon, women attend clinics, consume medication, manage feeding, and interface with workers, while male involvement remains peripheral.

Thus, service expansion may improve health indicators without fundamentally altering gendered power arrangements.

Anganwadi Workers as brokers of the state

AWWs occupy an intermediary social position: simultaneously bureaucratic representatives and community members. Their effectiveness depends on moral credibility, kinship ties, and reputation for fairness. They mobilize attendance, accompany referrals, and repeatedly revisit hesitant households.

This brokerage role resonates with analyses of how state authority operates through intimate social relations rather than distant command (Foucault, 1991). Governance becomes persuasive rather than coercive, enacted through advice, demonstration, and emotional labour.

Yet embeddedness is demanding. Workers must remain accountable to digital monitoring systems while maintaining harmony with neighbours. The strain between bureaucratic measurement and social belonging is a defining feature of frontline implementation.

Participation beyond attendance

Development policy often measures participation through numerical presence—who came to the meeting, who collected food, who registered pregnancy. However, participatory development research has shown that involvement is rarely immediate; it evolves through iterative interaction and credibility building (Mansuri & Rao, 2013).

Evidence from Gossaigaon supports this view. Mothers who initially resisted referral frequently complied after repeated visits or after witnessing improvement in neighbouring children. Engagement, therefore, is cumulative and moral, not procedural. Such episodes reveal both the challenges of referral and the capacity of ICDS-linked networks to mobilize treatment.

Why progress remains fragile

The rise in institutional birth and breastfeeding is real and significant. Yet these gains rely heavily on stable relationships with trusted workers. Transfer of personnel, interruptions in supply, or breakdown of transport could rapidly weaken confidence.

Hence infrastructure alone is insufficient. The durability of ICDS achievements rests on sustaining the social networks through which legitimacy is produced.

Theoretical contribution

By integrating statistical outcomes with ethnographic process, this study advances three propositions relevant to maternal and child health implementation:

1. Cultural mediation constitutes hidden infrastructure**.**

2. Hybrid therapeutic behaviour is normal rather than transitional.
3. Frontline discretion is a driver of equity and access.

Recognising these dimensions can help policymakers design interventions that strengthen, rather than bypass, the relational foundations of care.

Toward relational public health

Maternal and child health in marginalized settings should be conceptualized as a field of relationships. Investment in the training, dignity, and continuity of frontline women workers may generate deeper and more sustainable outcomes than technological expansion alone.

Limitations

This study was conducted within a single Integrated Child Development Services (ICDS) project area and therefore does not aim to provide statistically representative estimates for all tribal regions of Assam or India. The survey component was designed to generate descriptive implementation insights rather than population-level inference, and some subgroup analyses involved modest sample sizes. In addition, selected maternal and childcare practices were based on self-reported information and may be influenced by recall or social desirability bias. However, prolonged ethnographic engagement, participant observation, and triangulation across interviews, field records, and programme documentation strengthened the reliability of interpretation. While broader comparative quantitative analysis was beyond the scope of available time and resources, the findings offer analytically transferable insights into frontline health programme implementation in geographically remote and socially marginalised settings. These considerations should be taken into account when interpreting the findings while recognising the study's contribution to understanding everyday policy implementation processes.

Conclusion

This study explored how maternal and child health services under ICDS are realised in everyday life within Adivasi communities of Gossaigaon. The findings demonstrate meaningful advances in institutional delivery, breastfeeding initiation, immunization awareness, and access to growth monitoring. However, these improvements are not the mechanical result of programme availability. They are produced through continuous relational work undertaken by Anganwadi Workers who translate policy into culturally intelligible forms, negotiate resistance, and sustain trust across households.

The persistence of herbal practices, ritual observances, and gendered divisions of responsibility indicates that biomedical expansion does not replace existing social logics but becomes incorporated within them. Implementation therefore depends on coexistence rather than substitution.

Recognizing frontline mediation as a central component of health infrastructure has practical implications. Investments in worker support, stable employment conditions, culturally grounded

communication, and strategies to involve men are essential for maintaining progress. Without these relational foundations, gains may remain fragile.

By situating statistical outcomes within lived practice, this research contributes evidence that maternal and child health improvement in marginalized regions is fundamentally social as well as technical. Policies succeed when they travel through trusted people.

Declarations

Ethics approval and consent to participate

Ethical review and approval were formally waived by the **Departmental Research Committee, Department of Anthropology, Gauhati University, Assam, India**, which functions as the institutional ethics review body for postgraduate and faculty research involving human participants within the department. The waiver was granted as the study involved non-invasive ethnographic research and anonymised survey data collected through voluntary participation and informed consent, in accordance with institutional research guidelines applicable to social science field studies in India. All participants provided informed consent prior to participation, and all procedures were conducted in accordance with the principles of the Declaration of Helsinki.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and analysed during the current study are available from the corresponding author on reasonable request, subject to community confidentiality considerations.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

Barasha Roy conducted fieldwork, data collection, and primary ethnographic documentation. Arifur Zaman conceptualised the study design, supervised analysis, and prepared the manuscript. Both authors reviewed and approved the final manuscript.

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Supplementary Information

Supplementary material accompanying this article is available online.

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Figures

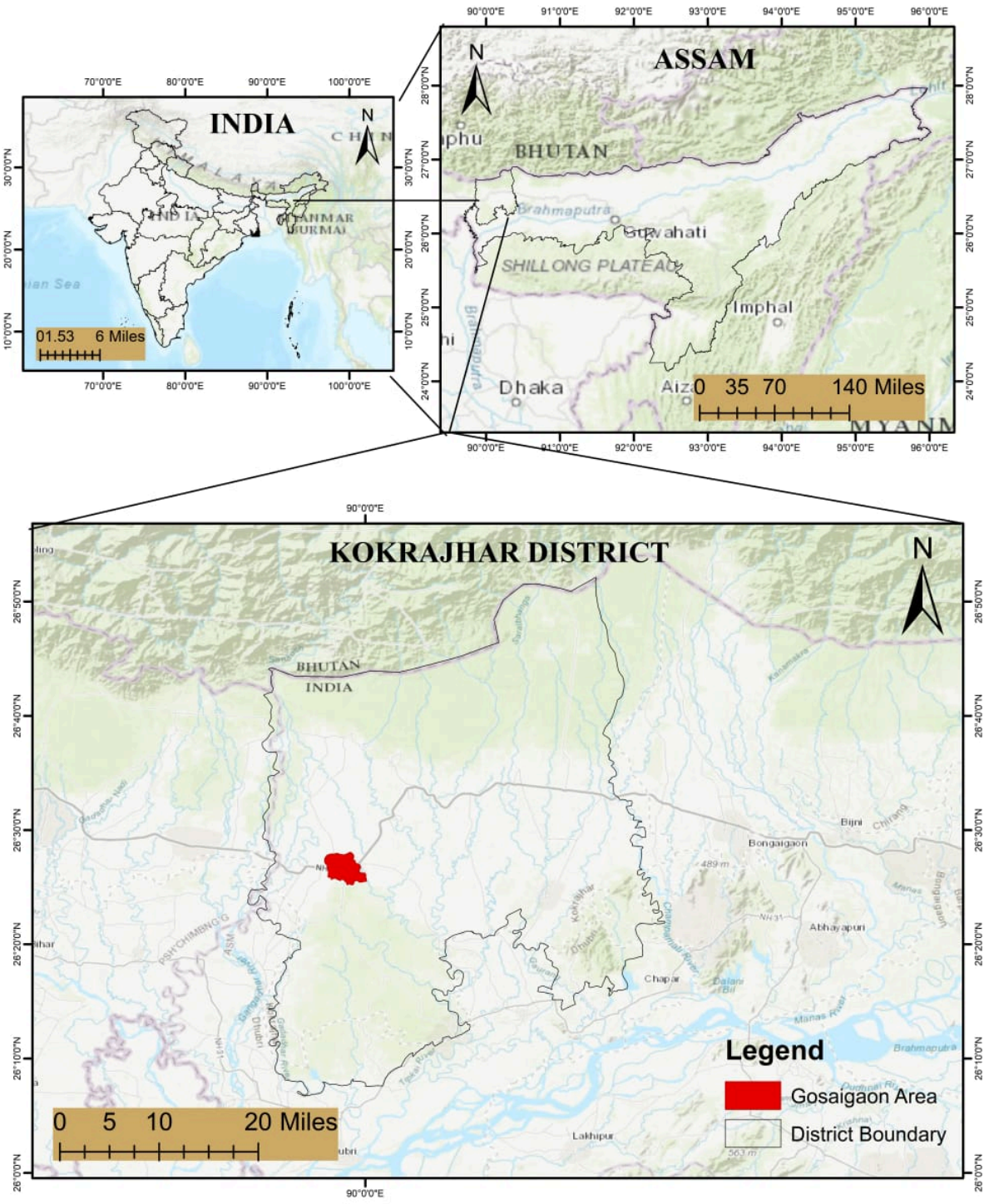


Figure 1

Map of the study area — Gossaigaon, Kokrajhar District, Assam

Supplementary Files

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