

PRESS RELEASE ON THE 412th REPORT OF THE DEPARTMENT-RELATED PARLIAMENTARY STANDING COMMITTEE ON SCIENCE AND TECHNOLOGY, ENVIRONMENT, FORESTS AND CLIMATE CHANGE

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The Department-related Parliamentary Standing Committee on Science and Technology, Environment, Forests and Climate Change headed by Dr. Medha Vishram Kulkarni, M.P., Rajya Sabha, presented/laid the 412th Report on **‘Forest Fires in the Himalayan Region, its adverse effects and mitigation’**, in both the Houses of Parliament on Friday, the 7th August, 2026.

2. The Committee had considered the draft report and adopted the same in its meeting held on 05th August, 2026. The Recommendations/Observations made by the Committee in the report are enclosed.

3. These Reports are also available on <https://sansad.in/rs>

412TH REPORT ON ‘FOREST FIRES IN THE HIMALAYAN REGION, ITS ADVERSE EFFECTS AND MITIGATION’

RECOMMENDATIONS/OBSERVATIONS-AT A GLANCE

FOREST FIRES IN THE HIMALAYAN REGION: EXTENT AND TRENDS

The Committee desired to know as to whether any research has been undertaken on the linkage between climate change and increasing fire frequency in the Himalayan region and put a query to this effect to the Ministry of Environment, Forest and Climate Change. In response, the Ministry stated that it recognises that rising temperatures, prolonged dry spells and increasing climate variability are contributing factors to the increasing frequency and intensity of forest fire occurrence in the region. The Ministry, however, informed the Committee that no specific research study on this linkage has, as yet, been commissioned or assigned by the Ministry.

(Para 2.17)

The Committee notes that there is no dedicated research study to establish or quantify that climate change is a contributing factor to the rising frequency and intensity of forest fires in the Himalayan region. The Committee takes note of the ongoing work under the NCSFFM at ICFRE-FRI; however, it observes that this work, being forward-looking and scenario-based in its design, is oriented towards projecting future fire vulnerability rather than towards empirically establishing the historical relationship between climate variables and past fire incidence. The Committee is, therefore, of the view that a knowledge gap persists in this regard, and that the Himalayan region,

given its ecological fragility, topographic complexity and high sensitivity to climatic shifts, requires dedicated region-specific research rather than reliance on general or extrapolated findings from other forest ecosystems. (Para 2.20)

The Committee, therefore, recommends that the Ministry should commission a dedicated, region-specific research study to establish the empirical linkage between climate change and forest fire frequency, intensity and seasonality in the Indian Himalayan Region. Such a study should, at a minimum, examine long-term trends in temperature, precipitation and dry-spell duration against historical forest fire incidence data; assess how altitudinal and species-wise variation across Himalayan forest types affects fire vulnerability under changing climatic conditions; and generate predictive fire-risk models that can inform seasonal preparedness, resource deployment and early-warning systems. The Committee further recommends that this research be undertaken in coordination with, and to complement, the vulnerability mapping already underway under the NCSFFM, so as to build an evidence base that spans both retrospective analysis and future projection. It also recommends that the findings of such research be periodically updated and integrated into the Ministry's forest fire prevention and management guidelines, so that policy responses keep pace with the evolving climate-fire relationship rather than being based on generalised assumptions.

(Para 2.21)

REGIONAL FIRE REGIMES: WESTERN AND EASTERN HIMALAYA

The Committee observes that these contrasting dynamics — the Western Himalaya's fire threat being driven primarily by extreme pre-monsoon heat, pine-needle fuel loads and proximity-based human ignition, as against the Eastern Himalaya's more complex interplay of atmospheric dryness and cultivation-linked burning practices — demonstrate that a uniform, pan-Himalayan approach to fire prevention and mitigation would be inadequate to the distinct ecological and socio-economic realities of the two regions. The Committee is, therefore, of the considered view that mitigation and adaptation strategies must be tailored separately to each region.

(Para 3.4)

The Committee further recommends that any national or regional forest fire prevention framework explicitly recognise and provide for this West-East differentiation, so that resource allocation, early-warning systems and community engagement strategies are calibrated to the distinct climatic and anthropogenic drivers operating in each sub-region. (Para 3.5)

ADVERSE EFFECTS OF FOREST FIRES

The Committee is of the considered view that this constitutes a significant data gap, particularly since human casualties are explicitly recognised as among the major adverse effects of forest fires. In the absence of a consolidated national record, the true human cost of forest fires across States remains obscured, hampering both accountability and evidence-based policy formulation. The Committee, therefore, recommends that the Ministry take urgent steps, in consultation with State Governments, to develop and maintain a centralised database capturing details of forest fire casualties and compensation paid, to enable systematic monitoring and informed policy interventions. (Para 4.4)

The Committee further notes that Himalayan forests perform a critical watershed function, regulating infiltration, groundwater recharge and spring discharge on which the majority of the region's population depends for drinking water and irrigation. Forest fires, by removing canopy

cover and litter and altering soil infiltration, directly compound this existing stress on spring-fed systems, particularly in shallow-soil mountain catchments where recovery is slow even without the added pressure of fire. (Para 4.5)

The Committee, therefore, recommends that the Ministry, in coordination with the Ministry of Jal Shakti and concerned State Governments, develop a structured protocol for post-fire watershed and spring rejuvenation, comprising the following elements: first, mandatory post-fire hydrological assessment of burnt catchments, to identify springs, streams and recharge zones within or downstream of the affected area; second, inclusion of such assessments in existing forest fire damage-reporting mechanisms, so that hydrological impact is captured alongside data on area burnt and vegetation loss; third, prioritised taking-up of identified fire-affected springsheds under ongoing National and State spring rejuvenation and watershed management programmes, rather than routing them through the ordinary, non-prioritised project pipeline; and fourth, monitoring of spring discharge and water quality in fire-affected catchments following a fire event, to track recovery and inform future silvicultural and soil-conservation interventions. The Committee is of the view that without such a structured linkage, the water-security consequences of forest fires will continue to go unaddressed, even as the underlying vegetative damage is documented and acted upon. (Para 4.6)

FOREST FIRE MONITORING AND EARLY WARNING SYSTEMS

The Committee notes that even after so many years of using the satellite technology and despite India being a leader in the space sector; the country is still relying on foreign satellites for monitoring of forest fires. The Committee also notes with concern that there is a significant diurnal observational gap i.e. no satellite pass between 01:30–10:30 and 13:30–22:30. The Committee, therefore, urges the Department of Space to prioritise the launch of a geostationary satellite capable of round the clock monitoring the forest fires.

(Para 5.18)

The Committee notes the State Government of Uttarakhand's submission that only around 12.5 per cent of FSI alerts received corresponded to verified actual forest fires. The Committee is of the view that a high proportion of false positives carries the real risk of alert fatigue among field-level and nodal officers, who may over time come to treat alerts as routine rather than actionable, thereby eroding the very purpose of an early-warning system. The Committee accordingly recommends that the Ministry, in coordination with State Forest Departments, institute regular, structured training for nodal officers and field staff on the interpretation, verification and triage of FAST 3.0 alerts, including guidance on distinguishing likely forest fires from agricultural or controlled burning based on geographical, seasonal and land-use context.

(Para 5.19)

The Committee notes that the Forest Fire Alert System under FAST 3.0 operates on a subscriber-registration model, reaching only those citizens who have proactively enrolled — a number that happens to be low in several highly fire-prone North-Eastern States. The Committee is of the view that a registration-dependent model is structurally unsuited to the objective of an early-warning system, since it excludes, by design, the very population that has not anticipated the need to register. The Committee notes that the National Disaster Management Authority, in coordination with the Department of Telecommunications, has already developed and is progressively operationalising a Cell Broadcast Alert System, capable of delivering geo-targeted alerts to all mobile handsets within an affected area — irrespective of prior registration — for hazards including earthquakes, tsunamis, lightning strikes and man-made hazards. The Committee is of the

view that forest fires, given their acute seasonal concentration and the demonstrated speed of alert dissemination achievable under FAST 3.0, are equally suited to this mode of delivery. The Committee accordingly recommends that the Ministry, in coordination with NDMA and the Department of Telecommunications, examine the feasibility of integrating FAST 3.0-generated fire alerts into the Cell Broadcast Alert System architecture, so that geo-targeted warnings reach all mobile users in a defined at-risk radius — including transient populations, tourists and non-registered residents — without dependence on prior subscription. (Para 5.20)

The Committee also notes that both the temperature-driven fire regime of the Western Himalaya and the atmospheric aridity-driven regime of the Eastern Himalaya are, at their core, functions of meteorological variables that fall within the domain expertise of the India Meteorological Department (IMD). The Committee is of the view that forest fire prediction and early-warning capability in the Himalayan region would be considerably strengthened through closer institutional collaboration with IMD. Accordingly, the Committee recommends that the Ministry in coordination with IMD, develop a formal collaborative framework under which IMD's high-resolution weather forecasting models, including its medium-range and extended-range prediction systems, are integrated into forest fire risk assessment and early-warning tools for the region. The Committee further recommends that this collaboration extend to the sharing of real-time data with State Forest Departments and district-level disaster management authorities, so that fire-risk advisories can be issued with sufficient lead time to enable preventive deployment of resources. (Para 5.21)

DISASTER MANAGEMENT AND RESPONSE

The Committee notes that presently only two battalions of NDRF are deployed for forest fires one each in Western and Eastern Himalayan region. The Committee also notes that six NDRF teams stand trained for forest fire duties while only three are formally earmarked, leaving three trained teams without confirmed institutional sanction. The Committee further notes that proposal for two more battalions for the Western Himalayan region is pending, inspite of the demonstrated inadequacy of NDRF's forest fire response capacity — established by the Department's own experience during the 2024 fire season in Uttarakhand and Himachal Pradesh. The Committee therefore recommends that approval to the pending proposal for three additional teams for forest fire duties may be granted at the earliest.

(Para 6.12)

The Committee welcomes the exposure of NDRF officers to international best practices but notes that such exposure has, thus far, been limited to only two officers. The Committee recommend that foreign training and exchange opportunities be systematically expanded, particularly with countries facing comparable montane and boreal fire regimes, and that a structured, terrain-specific curriculum for high-altitude firefighting — going beyond the present institutional arrangements — be formally documented and periodically updated.

(Para 6.14)

The Committee notes that the 30-minute benchmark relates only to mobilisation from the Unit Headquarters or Regional Response Centre, and does not capture the time actually taken to reach the fire site — which, in Himalayan terrain, is likely to be the more operationally meaningful metric. The Committee recommends that NDRF maintain and report, on a year-wise and State-wise basis, data on actual site-arrival times in addition to mobilisation times, so as to permit a more accurate assessment of response effectiveness specific to Himalayan conditions.

(Para 6.16)

The Committee recognises that several of these challenges are inherent to Himalayan geography and cannot be eliminated. They can, however, be mitigated through targeted infrastructure investment. The Committee recommend that the Ministry concerned, in consultation with State Governments, identify and develop critical response infrastructure including helipads in the most fire-prone Himalayan districts, so as to reduce the practical impact of terrain and connectivity constraints on response time.

(Para 6.20)

The Committee feels that in view of NDRF's own assessment of inadequate manpower, its detailed articulation of operational lessons, and the availability of cost estimates for a dedicated Himalayan Battalion and Regional Response Centre, a dedicated, rather than a purely requisition-based and pilot, disaster response capability, for the region, is required. The Committee, therefore, recommends that the Ministry of Home Affairs and NDMA take a time-bound decision on establishing at least two Regional Response Centers dedicated to the Himalayan region — one for the Western Himalaya and one for the Eastern Himalaya.

(Para 6.24)

FINANCIAL ASSISTANCE FOR FOREST FIRE PREVENTION AND MANAGEMENT

The Committee recommends that the Ministry expedite the SFC's approval for the continuation of the strengthened FFPM scheme at the earliest since the scheme has already lapsed its five-year tenure, there is no let up in forest fire incidents and any hiatus in dedicated forest-fire funding carries direct operational risk during the fire season. The Committee is also of the opinion that till such time, the SFC comes up with any recommendation regarding renewal of FFPM, an alternate mechanism on the lines similar to FFPM, may be put in place as an interim measure. The Committee further recommends that in the renewed FFPM scheme, subsequent fund releases should be explicitly tied to quantifiable performance indicators, including measurable reductions in fire counts and burnt areas, improved average response times, and the consistent maintenance of fire lines. States should be required to submit detailed Annual Fire Management Plans, similar to CAMPA's Annual Plan of Operations, that clearly delineate physical targets against financial outlays.

(Para 7.8)

The Committee recommends that instead of relying on CAMPA funds, which are intended primarily for compensatory afforestation and allied purposes, to substantially finance forest fire prevention and control operations, the renewed FFPM scheme be adequately funded to manage the requisite finances.

(Para 7.9)

BEYOND THE CHIR PINE MONOCULTURE: RESTORING THE HIMALAYAN FOREST

The Committee finds this admission significant. It indicates a gap in the evidentiary and historical-ecological record that has, for decades, allowed the "naturalness" of Chir Pine dominance to go unexamined even as its consequences for fire regimes have grown steadily more severe.

(Para 8.3)

The Committee is of the considered view that this finding recasts the problem: the challenge before the Government is not merely the management of a historically inherited monoculture, but the active containment of a still-expanding one that is displacing broad-leaved oak forests of far greater ecological and hydrological value. The Committee recommends the Ministry to commission, through FRI or an appropriate research body, a dedicated historical-ecological study tracing the changes in forest composition in the Western Himalayan belt from the pre-colonial period to the

present. Without such a study, the Government's restoration strategy will continue to be formulated without a clear reference point for what constitutes ecological recovery.

(Para 8.5)

The Committee recognises the soundness, in principle, of a site-specific approach anchored in Working Plans rather than a blanket national prescription — Himalayan forest ecology is heterogeneous, and uniform replacement targets could well cause more ecological harm than good. However, the Committee observes that there is no dedicated national mission or Action Plan, when read alongside the evidence of Chir Pine's active expansion into oak habitats, where cross-State coordination and dedicated financial outlay are required. The Green India Mission and CAMPA, being general-purpose afforestation instruments, were not designed with the specific objective of arresting conifer encroachment into broad-leaved forest. The Committee, therefore, recommends that the Ministry should launch a dedicated programme specifically targeted at broad-leaved forest restoration in Chir Pine-dominated micro-sites of the Western Himalaya, with clear, measurable targets and dedicated budgetary allocation, rather than leaving such restoration to be addressed incidentally through general afforestation schemes.

(Para 8.8)

The Committee finds this graded, site-sensitive approach scientifically sound and considerably more defensible than an administratively convenient but ecologically indiscriminate replacement programme.

(Para 8.10)

The Committee therefore concurs that large-scale substitution of Chir Pine by Chilgoza Pine in the lower Himalaya would be scientifically unsound, though it sees merit in the promotion of Chilgoza Pine within its own suitable dry-temperate habitats, for both livelihood and conservation purposes. The Committee is also in agreement with the scientific consensus against blanket species replacement and recommends that any enrichment planting undertaken under Working Plans be preceded by site-suitability assessment, so that broad-leaved species are introduced only where soil moisture, aspect, and microclimatic conditions genuinely favour their establishment.

(Para 8.12)

The Committee notes that despite the presence of documented invasive tree species across Uttarakhand, Himachal Pradesh, and Jammu & Kashmir, no scientific study has been undertaken by FRI to determine appropriate containment or eradication measures. The Committee, therefore, recommends that the Ministry undertake a dedicated scientific study assessing the ecological spread and fire-risk contribution of all the invasive species, and prepare comprehensive invasive species management plans incorporating containment and eradication measures.

(Para 8.17)

The Committee further recommends that the Ministry launch a dedicated programme for the eradication of invasive species in the forests of the Himalayan region, with clear, measurable targets, defined timelines, and dedicated budgetary allocation.

(Para 8.18)

The Committee notes that the current pace and species-composition of afforestation efforts in the Western Himalayan region are inadequate to address the vulnerability of the Himalayan forest ecosystem. The Committee also notes that Oak and Deodar regeneration are still being treated as just one part of the general afforestation target, rather than as a distinct programme with its own funding and monitoring. The Committee is of the opinion that Oak and Deodar cannot be expected to hold their own within a general target when competing against Chir Pine, which is easier and quicker to plant. A dedicated Mission, with its own ring-fenced funds, its own targets, and separate reporting, is needed to achieve real results on the ground. The Committee accordingly recommends

that the Ministry, in close and sustained coordination with the concerned State Governments, launch a Himalayan Oak and Deodar Regeneration Mission for Oak and Deodar regeneration across the Western Himalayan region. (Para 8.30)

The Committee notes that even as afforestation is being scaled up, Himachal Pradesh and Uttarakhand together diverted 6,511.165 hectares of forest land for non-forestry purposes over the last five years. The Committee is of the considered view that a Mission to expand Oak and Deodar cover would be substantially undermined if diversion of exactly such mature, ecologically valuable forest continues unchecked in parallel. The Committee accordingly recommends that the Ministry apply stricter scrutiny, under the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980, to any proposal to divert Oak, Deodar or mixed coniferous forest. The Committee further recommends that compensatory afforestation for any diversion of Oak or Deodar forest be planted mandatorily with the same or an ecologically similar species, and at a higher area ratio than applies to general compensatory afforestation. The Committee is of the view that this two-pronged approach — pushing Oak and Deodar regeneration forward under a dedicated Mission while tightening the rules on diverting exactly these forest types — offers the most coherent way to ensure that development in the region does not undo, with one hand, the gains being built with the other. (Para 8.31)

PINE NEEDLE MANAGEMENT AND UTILIZATION: BUILDING A PARALLEL ‘PIRUL’ ECONOMY

The Committee, taking into account the submissions made by State of Uttarakhand, strongly recommends that the intensive collection of pine needles be institutionalized on a mission mode as an annual pre-fire-season activity, backed by adequate budgetary support, procurement guarantees, single window clearance for subsidy and infrastructure for value addition, to serve the twin objectives of forest fire mitigation and rural livelihood promotion. The Committee also recommends the Ministry of Environment, Forest and Climate Change (MoEFCC) to examine national and international best practices for developing appropriate quality standards and certification mechanisms through research, inter-governmental consultations, and exposure visits, so as to create a commercially viable circular economy by utilising pine needles (pirul).

(Para 9.13)

The Committee, taking into consideration the submissions made by Government of Himachal Pradesh, is of the view that a dedicated national policy or incentive mechanism for pine needle utilization would provide a significant fillip to states like Uttarakhand and Himachal Pradesh that are grappling with the twin challenges of fire hazard reduction and sustainable rural livelihoods in pine forest landscapes. (Para 9.24)

The Committee, in line with the submissions made by Government of Himachal Pradesh, is of a strong view that a technical study group may be constituted at national level to study relevant international standards (ISO, EU RED, SBP, ISCC etc.) and a gap analysis be conducted between domestic norms and international benchmarks. The Committee suggests launching a voluntary pilot certification scheme for biomass processing units. Simultaneously, harmonized national quality standards for biomass fuel (briquettes, pellets, chips) be developed to strengthen/accredit testing labs for fuel quality certification and integrate adopted standards into national/state biomass and energy policies, so that biomass based products derived from pirul etc. can also be exported.

(Para 9.25)

Having thoroughly gone through the submissions made by the independent subject-experts, the Committee is of the strong opinion that every pine needle left on the forest floor is both a fire hazard and a wasted energy resource. Also, it has been established beyond doubt that systematic

removal of pine needles converts a recurring liability into a sustainable renewable energy circular economy. The Committee strongly advocates that Pirul model should not be treated only as a biomass procurement activity, rather it should also be seen as a forest-fire prevention service plus biomass value-chain model, where collection payments create livelihoods by industrial off-take, thereby converting fire-risk material into economic value. (Para 9.54)

At the same time, the Committee is also careful of the fact that pine-needle removal has to be undertaken in a systematically effective means. The Committee accordingly endorses a regulated, zone-specific approach: collection concentrated in identified fire-prone zones such as roadsides, fire-lines, forest edges, settlement-adjacent areas, and slopes with a history of repeated burning. (Para 9.55)

The Committee notes with interest the range of productive uses to which collected pine needles may be put — bio-briquettes, pine-peat, biochar, biomass energy, compost, handicrafts, and packaging material — each of which carries the dual advantage of reducing surface fuel load while generating supplementary income and employment for local communities, thereby aligning fire-prevention objectives with livelihood generation. Moreover, community participation secured through economic incentive is likely to prove more durable and effective than fire-prevention measures reliant on departmental enforcement alone. (Para 9.56)

The Committee, therefore, is of the firm view that the pine needles possess a huge commercial potential that needs to be harnessed. The Committee, accordingly, recommends to establish a fixed minimum procurement rate per unit weight (e.g. per kg or per quintal) of collected pine needles, paid directly to collectors, through a transparent mechanism, to encourage sustained community participation. Apart from that, there is a strong need to promote the establishment of decentralized units for converting pine needles into briquettes, pellets, biochar, handicrafts, and packaging material, enabling local employment and additional revenue streams. Moreover, private entrepreneurs and start-ups be encouraged to set up pine-needle-based power generation or briquette units, supported through subsidies, low-interest loans, or capital grants. (Para 9.57)

The Committee noted that the present policy framework is strong on fire detection, alerts and emergency response, but still weak on pre-season prevention, fuel-load removal and long-term community ownership. Key gaps remain in assured pine needle (Pirul) offtake, stable funding, Panchayat-level accountability, fire-watcher protection, prescribed-burning clarity and inter-state replication. In view of this, incentives should be provided for fuel-load removal and forest aggregation, while penalties may be considered for negligent burning or unmanaged fire risk on private/community forest lands. Also, each Himalayan state should appoint a nodal agency for Pirul management, PPP development, capacity building and replication of proven models. (Para 9.58)

The Committee also recommends that time-bound, village-level collection drives before the onset of the fire season (typically February–May), be made mandatory and the same be coordinated by the Forest Department of respective States in partnership with local self-help groups, van panchayats, and community forest management committees. IEC (Information, Education, Communication) activities must be undertaken to sensitize communities on the fire-prevention and income-generation benefits of pine needle collection. The Committee strongly recommends that the intensive collection of pine needles be institutionalized as an annual pre-fire-season activity, backed by adequate budgetary support, procurement guarantees, well defined subsidies, if any, and infrastructure for value addition, to serve the twin objectives of forest fire mitigation and rural livelihood promotion.

(Para 9.59)

The Committee has very carefully gone through the practical problems and challenges faced by the independent domain experts on the ground and notes that the collection of the pine needles and economics involved therein is the determining factor for designing a sustainable pirul economy. The Committee observes that the collection and baling at village level to raise transport density; weighment against receipt at a depot; payment at a declared per-kilogram rate credited directly into the collector's bank account, with no Intermediary and no discretion; aggregation through Van Panchayats and self-help groups which hold the community mandate over these forests; hired haulage rather than an owned fleet; and a collection window of about three months, coinciding with the fire season are some of the aspects that need to be focused upon.

(Para 9.60)

The Committee is of the strong opinion that a dedicated Himalayan Pirul Management Mission with per-kg collection incentive, road-head infrastructure support and single-window permissions would be the most enabling intervention. The Committee, accordingly, recommends for a prevention-led “Himalayan Biomass Management Framework”, as a policy measure, where Pine needle management is recognized as a formal forest-fire mitigation activity. Overall, Himalayan forest-fire management must shift from a reactive suppression model to a prevention-led, livelihood-linked and biomass-monetization model.

(Para 9.61)

The Committee notes that the Government has notified biomass co-firing for thermal power stations and the plants are using bio-pellets today. Pine needle pellets, at 5,500 kcal/kg, are eligible and competitive within that demand. The Committee also notes that although the Central Government is currently promoting biomass collection and management as a component of various ongoing schemes, a dedicated national policy or incentive mechanism for pine needle utilization is the need of the hour. The Committee recommends that the Ministry, in coordination with State Governments, formulate a “National Pine-Needle Utilisation Policy” that (i) identifies and prioritises fire-prone collection zones on a scientific basis; (ii) provides fiscal and market-access incentives, including minimum support arrangements or subsidised collection infrastructure, to encourage community-based collection enterprises; and (iii) prescribes ecological safeguards to ensure that litter removal does not fall below the threshold required for soil and nutrient function.

(Para 9.62)

The Committee observes that the problems related to pine needle management are recurring in nature, namely: insufficient collection of pirul at source, the absence of an integrated pine needle supply chain, the lack of certification standards, and the absence of a national-level policy. The Committee is further of the view that a national-level regulatory body would address all the concerns more transparently and efficiently. Accordingly, the Committee recommends the MoEFCC to establish a National or Regional Pine Needle Management Board, for the overall supervision, coordination, implementation, and standardisation of pine needle management thereby fostering an integrated and sustainable supply chain for the affected States.

(Para 9.63)

The Committee is also of the opinion that in order to have an efficient and effective forest fire mitigation strategy, the supply side constraints of the pine-needle based enterprises need to be addressed on priority. Accordingly, the Committee recommends the MoEFCC to examine the following policy, regulatory and market interventions, in consultation with the concerned State Governments, to further mitigate this problem:

- (i) Pellets are the by-product; a cleared forest floor is the objective. Pine needle removal be treated as fire mitigation, not as a bioenergy scheme. Hence, it may be funded from forest protection budgets and judged by fire outcomes;
- (ii) assured pirul collection & supply to the plant gate, as the feedstock uncertainty is the single biggest reason lenders refuse biomass projects;
- (iii) notifying a collection support of Rs 3-4 per kg, paid by Government, routed through the manufacturer and credited directly into the collector's bank account against verified weighment with a published standard operating procedure. The finished pellets must land with the end user at ₹10-12/kg price at which sawdust pellets are already available. A support of ₹3-4/kg keeps pirul competitive, as without it the pine needle based pellets would be unsellable;
- (iv) stating the terms of every scheme with finality, eligibility, quantum, disbursement route so that support can be financed against. A subsidy that a lender cannot count is not a subsidy. Central (MNRE CFA) and State subsidies are generous on paper but cannot be “banked” as stacking is unclear, claims are multi-window, and disbursement timing is discretionary. Written and time-bound confirmation as to which subsidies apply to pirul pellet plants, that too *via* a single-window mechanism with a defined disbursement timeline, is crucial;
- (v) unambiguously classifying baled pine needles as forest waste, rendering it freely transportable without letters and permits;
- (vi) providing interest subvention and a seasonal working capital line, recognising that a year's raw material must be bought in three months;
- (vii) weighbridge-linked, geo-tagged recording of tonnage removed and mapping it against subsequent fire incidences so that the policy is evaluated on evidence;
- (viii) uninterrupted power throughout the season to ensure the Plant running for approximately 20 hours a day across a 100-day season. An assured night-time grid supply (priority feeder/no load-shedding) for the plant during the 4-month window, plus a reasonable industrial tariff and net-metering;
- (ix) leasing suitable land (forest/van panchayat/revenue) near the resource to the manufacturer for 10 years, as buying the land inflates capital expenditure, locks the already scarce equity and subsidy into a non-earning asset;
- (x) pellets originating from fire-prone Himalayan belts be preferred within that existing demand; and
- (xi) pirul collection could also be listed as "extreme-weather-mitigation" work, in new VB-G RAM G Act (replacing MGNREGA) and subsequent guidelines, shifting part of the labour cost to central allocation; and
- (xii) industries operating in the western Himalayan region be mandated to use at least 20 per cent of their power requirements through pirul briquettes.

(Para 9.64)

MITIGATION STRATEGIES FOR THE EASTERN HIMALAYA

The Committee has taken note of the challenges and suggestions put forward by the State Government of Arunachal Pradesh. The Committee recommends that the Union Ministry of Environment, Forest and Climate Change, in consultation with the State Governments of all the Eastern Himalayan States, undertake a coordinated programme of forest-road and helipad

development in the most fire-prone Divisions across the region, rather than leaving terrain and accessibility to be addressed by individual States acting alone within their own budgetary means. (Para 10.6)

The Committee also recommends that the Ministry prescribe a common protocol, applicable across the Eastern Himalayan States, setting out the roles, reporting lines and response timelines governing the relationship between State Forest Departments and community-managed forest institutions, so that the strengthening of coordination in the region is pursued on a uniform basis rather than through separate, State-specific arrangements of varying rigour.

(Para 10.7)

The Committee further recommends that the Ministry establish a region-wide, multi-year training and capacity-building calendar for frontline forest personnel across the Eastern Himalayan States, delivered through shared training infrastructure where feasible, so that the general commitment to sustained capacity building found in individual State Action Plans is translated into a fixed, jointly resourced schedule rather than being pursued unevenly, State by State. (Para 10.8)

The Committee also recommends that the Ministry ensure timely release of funds against the approved Annual Plans of Operation of all Eastern Himalayan States under the Centrally Sponsored Scheme, so that forest fire management effort across the region is not constrained by delayed or partial disbursement. (Para 10.9)

More broadly, the Committee notes that the strategic interventions proposed by the State Government of Arunachal Pradesh mirror priorities that recur, in substance, across the Eastern Himalayan States. The Committee is of the view that these are, at their core, regional rather than State-specific challenges, and accordingly recommends that the Union Ministry of Environment, Forest and Climate Change convene the Eastern Himalayan States to draw up a single, time-bound regional action plan addressing the challenges jointly, with defined milestones, rather than requiring each State to arrive at its own separate strategy for problems that are substantially shared.

(Para 10.10)

The Committee notes that a single causal factor — Jhum cultivation — accounts for close to two-thirds of verified fire incidence in Manipur, and is of the considered view that no mitigation strategy for the Eastern Himalaya can be regarded as adequate unless it treats the regulation and progressive substitution of Jhum as its central objective, rather than as one item among several in a broader prevention programme. (Para 10.15)

The Committee finds it a matter of concern that a Department otherwise well served by satellite alerts, community institutions and a functioning early-warning architecture should be operating at less than half its sanctioned field strength, and is of the considered view that no expansion of technology or infrastructure can substitute for the frontline manpower required to act on the alerts that technology generates. The Committee recommends that a time-bound recruitment and deployment plan for frontline field staff in fire-prone Divisions be put in place without further delay, and that training coverage be closed through a phased, multi-year calendar so that the present gap between personnel trained and personnel enrolled for alerts does not persist indefinitely. (Para 10.20)

The Committee appreciates the State Government of Manipur's substitutive approach to a practice that is deeply embedded in tribal livelihood and cannot realistically be addressed through prohibition alone. The Committee, however, notes that the scale of budgetary commitment to this strategy is not in proportion to the scale of the problem it addresses: an allocation of Rs. 19.04 lakh

in dedicated Jhum rehabilitation funding for a single year, set against a causal factor responsible for roughly two-thirds of all fire incidents in the State, suggests that livelihood substitution is being pursued at a pace well below what the underlying fire-reduction objective would require. The Committee also recommends that the incentive scheme for fire-free villages, presently described only in general terms, be formalized with a transparent disbursement formula linked specifically to reductions in Jhum-related fire incidence within the village's jurisdiction, so that the scheme reinforces the substitution strategy directly rather than rewarding fire-free status as a general outcome.

(Para 10.25)

The Committee recommends that the coordination arrangements be formalized into a standing regional protocol for the Eastern Himalayan region, with points of contact and escalation procedures pre-identified rather than assembled afresh at the time of each cross-border incident.

(Para 10.28)

The Committee notes with concern that fire-driven degradation in Manipur's Protected Areas is compounding itself through invasive colonization, with *Ageratina adenophora* and *Lantana camara* establishing in exactly those patches that most need native regeneration to succeed. The Committee is of the view that this warrants a response distinct from general post-fire restoration, since an area left to natural regeneration under continuing invasive pressure is unlikely to recover in the manner the State's restoration data assumes. The Committee accordingly recommends that fire-affected Protected Areas be subject to mandatory invasive-species removal as a first step in restoration, ahead of or alongside assisted natural regeneration, rather than as an incidental activity folded into general weed management.

(Para 10.30)

The Committee further recommends that the Ministry of Environment, Forest and Climate Change should launch a dedicated, time-bound mission for the removal of invasive species across the forest landscapes of the Eastern Himalayan region, rather than leaving invasive-species control to be addressed piecemeal within individual State restoration programmes. Given that *Ageratina adenophora* and *Lantana camara* are reported to be spreading across fire-affected forest in Manipur and are not confined to that State alone, the Committee is of the considered view that the scale and cross-border character of the problem calls for a coordinated, region-wide response with dedicated Central funding, clear multi-year eradication targets, and a mechanism for monitoring reinvasion, rather than a series of disconnected State-level efforts that leave regenerating forest vulnerable to decolonization from neighbouring, untreated tracts.

(Para 10.31)

The Committee notes that Manipur has, in each of the last two financial years, received far less central funding than it had proposed under its Annual Plan of Operation — with only about forty per cent of the amount proposed for 2025-26 released so far. The Committee recommends that the Ministry release a larger share of the approved funds against Annual Plans of Operation. The Committee also recommends that NDMA process the pending proposal of Rs. 27.51 crore without further delay.

(Para 10.36)

The Committee recommends that the Ministry of Environment, Forests and Climate Change should favourably consider providing the Eastern Himalayan States with specialized four-wheel-drive vehicles, modern protective gear and mechanized firefighting tools suited to hill terrain, together with the ground-based sensors, AI-enabled camera towers and long-endurance unmanned aerial vehicles that States in the region have identified as gaps in their present technology base. Given that such gaps are likely to recur across the Eastern Himalayan States rather than being confined to any one of them, the Committee recommends that these equipment and monitoring

capabilities be procured and deployed through a common regional programme covering the Eastern Himalayan States, rather than through isolated, State-level procurement; and that communication infrastructure in remote fire-prone forest divisions be funded as core fire-management infrastructure in its own right, rather than addressed incidentally through general rural connectivity programmes. (Para 10.38)

The Committee further recommends that the Ministry support the Eastern Himalayan States on regular, high-resolution assessments of burnt areas, and on the construction of water-harvesting structures in high-altitude areas, given their usefulness in fire control. (Para 10.39)

The Committee also recommends that schemes rewarding fire-free villages be continued and strengthened across the region, since they directly encourage community participation in fire prevention; that adequate infrastructure — including barracks and offices for Range and Beat staff — be provided to frontline personnel; and that research into fire-resistant tree species be supported, so that the region's forests are made more resilient to fire over the long term. (Para 10.40)

The Committee recognises that several of the challenges faced by the North Eastern States are inherent to Himalayan geography and cannot be eliminated outright, but can be substantially mitigated through targeted infrastructure investment, sustained and predictable financing, and — above all, given the causal weight of Jhum cultivation — a decisively scaled-up livelihood-substitution programme. The Committee accordingly recommends that the Ministry, in consultation with the State Governments of the Eastern Himalayan region, treat the mitigation of Jhum-related fire risk as the foremost priority within the wider forest fire management effort for the Eastern Himalaya, with frontline manpower restoration, predictable Central financing, and shared regional technology platforms as the supporting pillars on which that priority effort must rest.

(Para 10.41)

MANAGEMENT FRAMEWORK: POLICY, LEGAL AND INSTITUTIONAL DIMENSIONS

The Committee welcomes the Ministry's move away from a one-size-fits-all approach, but is of the view that the value of these SOPs will be tested when actually put to use. The Committee recommends that the Ministry convert these SOPs into short, field-usable formats — laminated cards or an offline-capable mobile application in local languages — so that frontline staff on terrain without network connectivity can actually apply them, rather than the SOPs remaining lengthy documents confined to Divisional offices. The Committee further recommends that familiarity with the SOPs be made a component of annual refresher training and staff performance appraisal, so that compliance is incentivized rather than assumed, and that SOP-based mock drills be adopted as the standard method of testing these procedures under realistic field conditions. (Para 11.4)

On the Forest Fire Preparedness Index, the Committee is of the view that an index which is computed but not acted upon serves only as a diagnostic exercise rather than an instrument of governance. The Committee recommends that FFPI scores be directly linked to fund allocation under CAMPA and the NCSFFM, such that Divisions recording the weakest scores receive priority in equipment and manpower allocation for the following fire season, rather than allocation remaining a matter of administrative discretion. The Committee further recommends that FFPI scores be made public in the form of a Division-wise or State-wise comparative table, in the belief that public visibility will drive improvement more effectively than internal review alone. (Para 11.5)

On the standardization of firefighting equipment, the Committee recommends that the Ministry establish centralized rate contracts for standardized firefighting equipment, on the pattern of the Government e-Marketplace, so that States with weaker fiscal capacity are not compelled to procure inferior equipment at higher cost than better-resourced States. The Committee also recommends that the local manufacture of low-cost tools be supported through a simple quality-certification mechanism, enabling village-level cooperatives and small manufacturers to produce standardized equipment locally rather than every State depending on slow central procurement.

(Para 11.6)

On the Joint Convergence Guidelines under the VB-G RAM G Act, 2025, the Committee views this as a potentially significant vehicle for embedding forest fire prevention within rural livelihood and employment guarantee architecture. The Committee recommends that a fixed minimum share of convergence funds be ring-fenced specifically for fire-prone districts, rather than the allocation being left entirely to the State discretion. The Committee further recommends that the Ministry examine formalizing seasonal fire-watching and fire-line clearance as recognized job-card work under the employment guarantee framework. The Committee also recommends that release of convergence funds be tied to verified physical output — such as kilometres of fire-line cleared or fuel-load removed, cross-checked against satellite imagery — rather than to fixed budgetary allocation, so that funds intended for fire prevention are not diverted to unrelated purposes at the State level.

(Para 11.7)

The Committee looked closely at the existing laws that govern forests in India. These include the Indian Forest Act, 1927, the Forest (Conservation) Act, 1980 now renamed the Van (Sanrakshan Evam Samvardhan) Adhiniyam through the 2023 amendment, the Wildlife (Protection) Act, 1972, the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, and the Biological Diversity Act, 2002, together with subordinate instruments including the National Forest Policy, Joint Forest Management guidelines, and the Compensatory Afforestation Fund system. These laws were made at different times, for different reasons, and do not fit together well today. The Committee is of the view that this scattered approach is no longer suitable for present needs.

(Para 11.11)

The Committee notes that the Indian Forest Act, 1927 was made by the British mainly to control timber and protect Government revenue from forests. Its basic idea was that forests belong to the Government. The Committee is of the view that this old idea does not match how we understand forests today, where a forest is seen as a living system that provides many benefits beyond timber. The Committee notes with concern that the 1927 Act still focuses mainly on policing, offences, and seizure of forest produce, rather than on restoring and caring for forests.

(Para 11.12)

The Committee observes that India does not have a clear, simple legal definition of what counts as a "forest." For many years, courts have had to decide this instead of the law itself. A recent amendment has narrowed this further, so that many patches of land that look and function like forest, but were never formally recorded as such, may now fall outside legal protection. The Committee is of the view that this narrowing of definition introduces material uncertainty into forest governance, particularly in ecologically sensitive Himalayan and North Eastern landscapes where large tracts of forest remain outside formal classification despite meeting every ecological criterion of forest.

(Para 11.13)

The Committee notes that decisions to allow forest land to be used for other purposes are presently based mainly on development needs and on the promise of planting trees elsewhere to make up for the loss. The Committee is of the view that this approach does not draw any firm outer limit, so that in principle almost any forest can eventually be considered for clearance if the

development need is thought to be pressing enough. The Committee is of the considered opinion that certain forests are simply too valuable, and in many cases too difficult or impossible to recreate, to be judged on a case-by-case basis in this manner. (Para 11.14)

The Committee examined how compensatory afforestation works at present. When forest land is cleared for another use, the law requires new plantation to be raised elsewhere, even thousands of kilometres away, to make up for it. The Committee is of the view that this system focuses only on matching the area of land, not on whether the new plantation actually does what the lost forest did. A row of planted trees of one species is not the same, in ecological terms, as an old, mixed, natural forest, yet the law presently treats them as equal. The Committee recommends that new planting be matched to the kind of forest lost as closely as possible, that only local and native species be used, that the survival and growth of the new forest be checked regularly over many years, and that the results be made public rather than measured only by the number of saplings planted. (Para 11.15)

The Committee notes that the absence of a dedicated statutory framework for forest fire management, particularly given the escalating frequency and severity of forest fire incidents across the Himalayan region. The Committee also notes that forest fire management presently rests entirely upon scheme-based executive funding rather than upon any statutory obligation, and that forest fire is not presently notified as a disaster category under the Disaster Management Act, 2005, with the consequence that the institutional coordination and financial mechanisms available under that Act cannot be readily invoked in response to large-scale forest fire events. (Para 11.16)

The Committee opines that all the gaps discussed above point to one common underlying problem. The forest laws of India were built, in the first instance, mainly to allow Government control over forest land. Over the years, these laws have been changed here and there to allow more development, but the changes needed to protect people's rights, the health of forests, and the climate have not kept pace. Such changes have largely been left to courts and executive orders to work out as best they can, rather than being written clearly into the law itself. The Committee is of the view that this system leaves the protection of forests and forest communities dependent on individual judgments and administrative decisions, rather than on a settled and dependable law. The Committee accordingly recommends that the Government undertake a full and careful review of the existing forest laws, so that forest governance in India rests on a clear and modern legal foundation, one that properly protects the rights of forest communities, safeguards the health of forest ecosystems, and equips the country to deal with a changing climate. (Para 11.17)

The Committee notes that the deployment of these tools and safety gear to only five States, of which only Uttarakhand represents the Himalayan Region, is inadequate given the scale of fire incidence across the Western and Eastern Himalayan States. The Committee recommends FRI to substantially widen the field deployment of the Jhapa, rakes, modified sickle and CFES-DRDO safety gear to cover all Himalayan States, on a priority basis, and that the technical brochure for local manufacture be actively disseminated to Van Panchayats and Joint Forest Management Committees, and not confined to Forest Department headquarters only. (Para 11.20)

The Committee takes note of the post-fire eco-restoration model developed by the Forest Research Institute for fire-affected sub-tropical pine forests, which in the Himalayan context are overwhelmingly dominated by Chir Pine (*Pinus roxburghii*). The Committee notes, however, that the

very features that make this model ecologically sound — pine-needle and litter removal, construction of contour and staggered trenches and check dams, mulching, and sustained weeding to prevent the re-establishment of the fuel cycle — are labour-intensive and require multi-season follow-through rather than a one-time treatment. The Committee is of the view that a model of this nature cannot be operationalized through the plantation-and-handover approach typically funded under afforestation heads, and that its success will depend entirely on whether an institutional mechanism exists to sustain site-level labour and monitoring over the two-to-three fire seasons that assisted natural regeneration typically requires. The Committee accordingly recommends that the FRI model be adopted as the standard post-fire treatment protocol for Chir Pine-dominated landscapes under the FFPM scheme and CAMPA-funded restoration works.

(Para 11.22)

The Committee further recommends the FRI be entrusted with developing site-specific treatment prescriptions and monitoring protocols for each State, and that outcomes of restoration under this model be tracked against a fixed set of ecological indicators — survival and growth of gap-planted native species, reduction in ground fuel load, and recurrence of fire at treated sites — so that its performance can be evaluated.

(Para 11.23)

The Committee notes with concern that FRI, the institution possessing the scientific expertise to design forest-type-specific SOPs, indigenous firefighting tools and post-fire restoration models for the Himalayan Region, operates on project-tied, time-bound funding that terminates in 2026, with no dedicated Himalayan fire-research infrastructure or permanent manpower behind it. The Committee opines that this represents a structural mismatch between the scale of institutional reliance placed on FRI and the resources placed at its disposal. The Committee recommends that the Ministry ensure uninterrupted continuity of funding for Himalayan forest-fire research beyond the current NCSFFM cycle ending in 2026, and examine the creation of a dedicated, adequately staffed Himalayan Forest Fire Research Cell within FRI with assured multi-year, rather than project-tied, budgetary support, so that fire-behaviour research, long-term ecological monitoring and ground validation of vulnerability maps are not repeatedly disrupted by funding disruptions.

(Para 11.26)

The Committee agrees to the fact that major forest fire incidents in Himalayan and other forested states typically require simultaneous involvement of the Forest Department, State Disaster Management Authority, District Administration, Fire Services, Police, local Van Panchayats, and at times Defence/NDRF resources. In the absence of a unified command structure, overlapping or uncoordinated action is a real risk, leading to delayed response, duplicated efforts, or gaps in resource deployment. Since forest fires often spread across administrative or even state boundaries, a common, pre-agreed operational framework such as ICS would ensure that responding agencies from different jurisdictions can integrate into a single command structure rather than operating in silos.

(Para 11.31)

The Committee, while endorsing the UNEP's suggestion, recommends that the Incident Command System, or a functionally equivalent, nationally/state-adapted operational structure, be formally adopted as the standard on-scene management framework for major forest fire incidents. Necessary protocols should be integrated within the State Disaster Management Plan and Forest Fire Management Plans, with a clearly designated authority (e.g., a trained Incident Commander from the Forest Department or Disaster Management Authority) empowered to assume command upon activation. A standardized communication and reporting protocol be established under the ICS framework, ensuring interoperability of radio/communication equipment across departments. Pre-identified resource inventories (fire-fighting equipment, manpower, vehicles, aerial support where applicable) be mapped in advance at division/district level, to be activated seamlessly under

the Logistics function of ICS during an incident. Clear, pre-defined criteria/thresholds (e.g., area affected, number of active fire points, terrain risk) be established for when ICS is to be activated, to avoid ambiguity in escalation. The framework may first be piloted in high fire-incidence divisions (such as Chir pine-dominated belts) before scaling up state-wide, with lessons incorporated into subsequent rollout. Every major fire incident managed under ICS should be followed by a structured after-action review to refine the system based on ground experience.

(Para 11.32)

The Committee notes that while both States rely on the same underlying FSI satellite detection layer, Uttarakhand has built a dedicated, purpose-built mobile application with GIS navigation and an integrated command dashboard, whereas Himachal Pradesh relies on a more conventional SMS-and-telephone relay chain without reference to a comparable dedicated application.

(Para 11.36)

The Committee accordingly recommends that the Ministry, in consultation with FSI, examine the feasibility of extending a common, centrally supported fire-alert mobile application — built on the demonstrated Uttarakhand model — to all Himalayan States, so that GIS-based navigation, geo-tagged citizen reporting and integrated command-centre monitoring are not confined to States that have independently developed such systems. The Committee also notes with serious concern that although Uttarakhand has a fire alert mobile application but its utility on the actual ground level is bare minimum, undermining the very purpose for which the technology was introduced. The real-time detection and response to forest fire incidents continues to rely heavily on manual reporting, traditional watch-and-ward systems, and delayed escalation resulting in sustained year-on-year increase in instances of forest fires. Possible contributing factors include poor network connectivity in forest and hill terrain, lack of awareness or training among field staff and local communities, non-integration with frontline firefighting response mechanisms, and absence of a robust feedback/verification loop between the app and ground teams. The Committee, therefore, recommends that the Government of Uttarakhand urgently examine and address the operational gaps in the fire alert application's ground-level implementation and undertake corrective measures viz. conducting a field-level audit of the app's usage, identifying pine-abundance and fire-prone zones with poor mobile network coverage, establishing a GIS enabled real-time State-level or Division-level monitoring dashboard, instituting a mechanism for periodic review of the app's performance metrics especially during peak fire season and ensuring the community level involvement etc. so that the technological investment translates into a measurable and timely reduction in fire response time and damage.

(Para 11.37)

The Committee considers the Uttarakhand life insurance model as sound practice worthy of emulation and recommends that the Ministry encourage and, if necessary, co-fund life insurance coverage for seasonal fire watchers and community volunteers engaged in frontline fire suppression duties across all Himalayan States. The Committee, however, recommends that an independent audit mechanism be devised in order to ensure that the purpose intended to be served by this insurance model is actually being realised on the ground.

(Para 11.40)

The Committee notes that Himachal Pradesh's limited strength of official vehicles has direct operational consequences: quick deployment of Rapid Response Teams to a fire site cannot be assured if vehicle mobility itself depends on ad hoc hiring rather than a dedicated fleet. The Committee accordingly recommends that the MoEFCC facilitate access for Himachal Pradesh and other Himalayan States to dedicated firefighting vehicle fleet, so that rapid-response capability is not left contingent on short-term hired transport arrangements.

(Para 11.44)

The Committee has also taken a considered view of the suggestion given by the UNEP regarding its fire ready formula. The Committee acknowledges the fact that the current forest fire budgets in most Himalayan and forested states are overwhelmingly weighted towards reactive, seasonal suppression measures — fire-fighting crews, equipment mobilization, and emergency response — with comparatively limited, often ad-hoc, investment in year-round prevention (fuel-load management, fire-line maintenance, community engagement) or post-fire recovery (afforestation, soil and watershed restoration). The Committee also agrees to the fact that investment in prevention and preparedness substantially reduces the scale, frequency, and cost of suppression operations in subsequent years — making the shift not merely an environmental imperative but a fiscally prudent one.

(Para 11.45)

The Committee, therefore, finds it to be in the larger interest to endorse UNEP's suggestion and observes that forest fire-related public expenditure be progressively reoriented more towards prevention, preparedness, and recovery through a phased, monitored, and budgetary transparent transition. The Committee, accordingly, recommends the MoEFCC to carry out feasibility analysis of the proposed two-thirds/one-third allocation ratio as an indicative benchmark while formulating annual and multi-year forest fire budgets. A dedicated post-fire recovery fund/mechanism may also be institutionalized, covering afforestation, soil and water conservation works, and livelihood restoration in severely fire-affected areas. (Para 11.46)

The Committee recommends that Uttarakhand's idea of aligning fire lines along new forest roads be adopted by all Himalayan States, since a road already acts as a natural break against fire. Combining the two would save money on maintaining separate fire lines and also give fire-fighting teams faster access to the forest. While the Committee recognizes the underlying logic and potential cost/access benefits of this approach, it cautions against a blanket, one-size-fits-all adoption across all Himalayan States without a more rigorous, evidence-based evaluation. The Committee is of the view that treating a road as an adequate substitute for a dedicated fire line could create a false sense of security as its effectiveness depends on a number of factors viz. fire behavior, type of forest, litter composition, slope gradient, fire dynamics, vehicular movement, roadside vegetation, and human activity along forest roads (bidis, cigarettes, campfires, vehicle sparks) etc. In fact, aligning fire lines directly along roads may inadvertently increase, rather than decrease, fire incidence. Also, roads themselves require continuous maintenance (landslide clearance, monsoon damage repair, vegetation encroachment control) which may offset assumed savings, particularly in fragile Himalayan terrain prone to slope instability. Therefore, expanding this model uniformly, without site-specific Environmental Impact Assessment, risks conflating a fire-safety objective with unintended ecological costs. In light of the above, the Committee recommends that the Uttarakhand model be treated as a pilot precedent for study and not for an immediate replication. Its extension to all Himalayan States should proceed only after due diligence on terrain-specific fire behaviour, ecological impact, and road maintenance realities and not as an undifferentiated, state-wide mandate. The Committee also recommends that the MoEFCC may commission a comparative feasibility study across Himalayan States to assess forest type, terrain, fire history, and road-network characteristics before adoption. State-specific customization may also be enabled into any such guideline formulated thereon, rather than prescribing a single uniform standard. Where adopted, fire lines should supplement, not merely coincide with, road alignments while retaining a cleared buffer strip beyond the road edge, particularly in resin-rich pine belts.

(Para 11.49)

The Committee is of the view that control burning should not simply follow a fixed winter schedule every year. Instead, it should be timed using real fire-risk data, so that burning takes place on the safest possible days rather than on the same dates regardless of actual conditions. The Committee is also of the opinion that the dry grass, leaves, twigs and pine needles collected during fire-line clearing should be linked to local biomass collection and sale arrangements, so that Van Panchayats and JFMCs earn some income from this work. The Committee recommends that the State Governments and the Ministry examine using FFPM funds to set up such local collection-and-sale arrangements at fire-line sites.

(Para 11.50)

The Committee notes that the use of drones to identify persons deliberately setting forest fires deserves particular attention, since it moves fire management beyond suppression and into deterrence and enforcement. The Committee recommends that this practice be replicated across all Himalayan States. The Committee further recommends that Uttarakhand's State-wide mock drill model, which brought together departmental staff, local communities, Van Panchayats, Self-Help Groups and disaster response forces at a large number of sites, be adopted by other Himalayan States, so that preparedness is tested under realistic conditions before the fire season. The Committee also recommends for an assessment of these mock drills regarding its efficacy in actual fire conditions.

(Para 11.53)

The Committee agrees with the UNEP's suggestion for consider establishing multidisciplinary Burned Area Emergency Assessment Teams for major Himalayan fires, comprising forest ecologists, soil scientists, hydrologists, geologists, engineers, disaster-management specialists, health experts and community representatives and accordingly recommends the MoEFCC to consider establishing multidisciplinary Burned Area Emergency Assessment (BAEA) Teams for major Himalayan forest fire incidents, so as to enable prompt, well-rounded post-fire assessment covering ecological damage, soil and slope stability, water source impact, and community health and livelihood concerns. The Ministry may consider institutionalizing such teams on a standby basis, to be rapidly deployed following major fire events in Himalayan states.

(Para 11.54)

The Committee also agrees with the UNEP's suggestion that the forest-fire policy for the Himalayan region be explicitly aligned with Integrated Fire Management, rather than being centred principally on suppression. For the purpose, a coordinated framework may be developed for the Indian Himalayan region, while retaining state and landscape-specific planning. The framework, as prescribed by UNEP, should establish common principles, operating protocols, data standards, training requirements and mechanisms for mutual assistance among Himalayan States and Union Territories based on the integrated fire management approach organized around five mutually reinforcing elements – the 5Rs:

- (i) Review and analysis: understanding the causes, patterns, ecological context and socioeconomic drivers of fire;
- (ii) Risk reduction: addressing ignitions, fuel conditions and underlying landscape vulnerabilities;
- (iii) Readiness: strengthening forecasts, early warning, training, equipment and institutional preparedness;
- (iv) Response: ensuring rapid, safe and coordinated action when damaging fires occur; and
- (v) Recovery: protecting affected communities, repairing infrastructure and restoring fire-affected landscapes.

(Para 11.55)

The Committee, while concurring with UNEP's assessment, recommends that the Ministry recognize that India's core policy, financing, and technological architecture for wildfire management is already substantially in place, and that the gap lies not in the absence of measures but in uneven implementation, weak inter-state coordination, and insufficient attention to public health, post-fire hazards, and ecological recovery. Accordingly, the Ministry should prioritize consolidating and strengthening existing systems through a dedicated Himalayan-region Integrated Fire Management approach, rather than creating disconnected mechanisms. This approach should focus on improved interstate coordination, ecological differentiation across Himalayan states, deeper community participation, public-health preparedness, and structured post-fire recovery — backed by adequate, timely, and consistent financing and implementation across the region.

(Para 11.57)

RECONNECTING COMMUNITIES AND FORESTS

The Committee acknowledges the rights-and-responsibilities framework followed in Himachal Pradesh, under which local communities' well-established rights over forest resources of significant economic value are made conditional on their active participation in forest protection, particularly fire prevention. By linking resource rights directly to protection duties, this approach ties community incentives to conservation outcomes, rather than depending on awareness alone. The Committee is of the view that this is a structurally sound model which other Himalayan States would do well to examine. The Committee recommends that the Ministry, in consultation with the concerned State/UT Governments, examine the feasibility of adopting a similar rights-and-responsibilities framework across other Himalayan States, under which the enjoyment of established community rights over forest resources is linked to demonstrated participation in fire prevention and forest protection activities.

(Para 12.6)

The Committee finds that community participation works best when it is backed by clear economic incentives and defined roles, as seen in Himachal Pradesh and Uttarakhand, where this approach has produced real, measurable engagement. Participation that relies mainly on awareness campaigns, without any accompanying incentives, risks remaining superficial. The Committee recommends that the Ministry study the incentive-based models followed by Himachal Pradesh and Uttarakhand, with a view to developing a common set of minimum incentives, such as insurance cover for fire watchers, payments for fuel-load collection, and remuneration for local forest committee members, that can be adopted by all Himalayan States through funding from the FFPM Scheme and CAMPA.

(Para 12.10)

The Committee would like to draw attention of the Ministry and the concerned State/UT Governments to a form of forest protection that predates, and in many places continues to operate alongside, formal institutional mechanisms, namely the deep reverence in which local populations across the Himalayan and North-Eastern region hold their forests, expressed most vividly in the institution of sacred groves. The Committee takes particular note of the sacred groves of Meghalaya, which are preserved by Khasi and Jaintia communities as abodes of local deities and ancestral spirits, and within which the felling of trees, hunting and even the removal of fallen wood are traditionally prohibited. The Committee observes that these groves, sustained purely through customary belief and community enforcement rather than statutory protection, have in many instances preserved old-growth forest and rich biodiversity more effectively and for far longer than

formally notified protected areas, and that similar traditions of sacred or reserved forest patches, in varying forms, exist among communities elsewhere in the Himalayan region as well.

(Para 12.11)

The Committee believes that this reservoir of reverence represents a latent conservation resource that formal policy has yet to draw upon adequately. The Committee recommends that the Ministry, in coordination with concerned State Governments, undertake a systematic documentation and mapping of sacred groves and similar community-protected forest patches across the Himalayan and North-Eastern region, and extend recognition and institutional support to the customary institutions, that sustain them, taking care that such support strengthens rather than displaces the customary authority underlying their protection. The Committee further recommends that the reverence embodied in the sacred grove tradition be actively invoked as a cultural resource in awareness campaigns for forest and fire protection in other Himalayan areas, so that conservation messaging draws upon an idiom of sanctity and ancestral obligation that resonates more deeply with local populations than administrative appeals alone, thereby helping to reconnect communities with their forests in a manner consistent with older, pre-modern traditions of custodianship.

(Para 12.12)

The Committee would also like to draw attention of the Ministry and the concerned State/UT Governments to a wider dimension of forest conservation that lies beyond formal committees, incentive schemes and sacred groves, namely the deep, custodial relationship that Himalayan communities historically shared with their forests in the pre-colonial and early pre-modern era, when forests were governed as commons integral to community identity, livelihood and cultural practice rather than as resources administered at arm's length by the State. The Committee is conscious that decades of restrictive forest governance, however well-intentioned in conservation terms, have in many areas weakened this older, organic bond between people and forest, and holds that its restoration, in a form suited to present-day realities, ought to be treated as a distinct objective of policy rather than an incidental by-product of fire management schemes.

(Para 12.13)

The Committee believes that this bond is best rebuilt through measures that make the forest a source of dignified and sustained livelihood for the local population, rather than through appeals to sentiment or tradition alone. The Committee recommends that the Ministry, in coordination with concerned State/UT Forest Departments, expand livelihood opportunities tied directly to sustainable forest produce, including non-timber forest produce collection and value addition, medicinal and aromatic plant cultivation, handicrafts and forest-based enterprises, so that communities derive continuing economic benefit from a standing, healthy forest and thereby acquire a durable stake in its protection.

(Para 12.14)

The Committee finds the response of the Ministry unsatisfactory. The unchecked growth of tourism infrastructure in the Himalayan region, including construction of hotels and resorts in and around forest areas, rising vehicular movement, and the generation of tourism-related waste, is a visible and growing pressure on Himalayan forest ecosystems, and the Committee is not convinced that reliance on general environmental laws and advisory guidelines is adequate to address a risk of this scale. The absence of any dedicated study on the link between unregulated tourism and forest fires, despite the sharp rise in tourist footfall across Himalayan destinations in recent years, points to a gap in the Ministry's evidence base that needs urgent attention. The Committee also notes that eco-sensitive zone notifications and protected area regulations, by their nature, apply only to specific designated areas, and leave a large part of the Himalayan forest landscape, including areas experiencing high tourist pressure, outside their coverage.

(Para 12.16)

The Committee recommends that the Ministry commission a dedicated study, to assess the extent to which unregulated tourism and associated activities contribute to forest fire incidence in the Himalayan region. The Committee further recommends that, based on the findings of such a study, the Ministry formulate a specific policy framework, in coordination with the Ministry of Tourism, State/UT Governments and other concerned Ministries/Departments, to regulate tourist activities and allied construction, including hotels and resorts, in and around forest areas of the Himalayan States. Such a framework should, at a minimum, provide for carrying-capacity limits for high-footfall destinations, stricter construction norms in forest-adjacent areas, and seasonal restrictions on activities that raise fire risk during peak fire-prone months, so that tourism growth in the Himalayan region does not come at the cost of the very forest ecosystem that draws such tourism in the first place.

(Para 12.17)

The Committee further recommends that the Ministry, in coordination with the Ministry of Tourism, concerned State/UT Governments and other stakeholders, take measures to develop and promote sustainable eco-tourism across the Himalayan region as a means of strengthening the bond between communities and forests. Such eco-tourism should be structured so that local communities are the primary beneficiaries and operators of tourism activity, rather than being reduced to incidental service providers for outside operators. Community-owned homestays, nature trails led by local guides, and village-based interpretation centres would allow communities to directly monetize their ecological knowledge and stewardship role, while ensuring that tourism activity remains within limits that the local ecology can sustain.

(Para 12.18)

The Committee also flags the need to extend ecological awareness to visitors from outside the region, who form a growing presence in Himalayan tourist destinations and whose conduct has a direct bearing on fire risk and forest health. The Committee recommends that the concerned State/UT Governments and the Ministry jointly develop visitor awareness measures, including signage, orientation material at entry points and popular destinations, and guided interpretation, to sensitize outside tourists to Himalayan forest ecology, fire-safe conduct, and the customs and conservation practices of local communities, including the significance of sacred groves and similar customary institutions where tourism intersects with them, so that the growing tourist footprint in the region becomes an ally of conservation rather than an added pressure upon it.

(Para 12.19)

The Committee opines that ecological literacy among the general public is in itself a form of conservation infrastructure, and the absence of accessible identification material represents a missed opportunity to convert public curiosity about Himalayan forests into informed, lasting engagement. The Committee strongly recommends that the Ministry prepare and publish elaborative field guides for identification of Himalayan trees, prepared in simple, easy-to-use language and richly illustrated with large photographs of tree forms, leaves, bark and other distinguishing features, so that such guides are genuinely usable by interested laymen without prior botanical training.

(Para 12.21)

The Committee also holds that public engagement with forest ecology must begin well before adulthood, and that the school years present the most effective window for cultivating a lasting connection with nature. The Committee is of the view that since ecological literacy has a direct bearing on the long-term stewardship of India's forests, including the Himalayan forest ecosystem, ecology should find a place as a mandatory subject in the school curriculum. The Committee

recommends that the Ministry of Environment, Forest and Climate Change take up the matter with the Ministry of Education with a view to introducing ecology as a mandatory subject at the school level. The Committee further recommends that schools be mandated to organize nature trails for students on a regular basis, so that classroom learning on ecology is reinforced through direct, first-hand exposure to forest ecosystems, thereby fostering in the younger generation a deeper and more enduring connection with nature and a stronger sense of responsibility towards its conservation.

(Para 12.22)

The Committee reiterates that reviving the older, custodial bond between communities and forests, whether through the documentation and support of sacred groves and similar customary institutions, expanded livelihood opportunities, community-led eco-tourism, or sustained awareness among outside visitors, together with investment in ecological literacy through accessible field guides and mandatory ecology education for school children, must be treated as long-term complements to these institutional and financial measures, so that the base of informed and committed stakeholders in forest ecosystem conservation continues to widen across generations.

(Para 12.23)

RKK

(रिलीज़ आईडी: 2296295) आगंतुक पटल : 790
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