



Concept Note for Mainstreaming Climate Sensitive Planning of Budgetary Schemes

Forest Department

Dec 2018

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Disclaimer

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Introduction - Climate Context and Forest Sector

Among the pressing development challenges for the country, coping with climate change impacts would demand utmost policy priority and action from Indian national and State governments. With rural, and particularly farm livelihoods highly vulnerable to projected changes in temperature and rainfall, the economic impacts would have a cascading effect across other sectors as well. While overarching policies and action plans are chalked out for sectoral responses (such as National Missions, SAPCC strategies etc.), it is equally important to enhance the understanding and capacity of government institutions on the dimensions of this challenge as it is to forecast future climate scenarios. This is owing to the significant scale of development programmes designed and delivered by the public administration.

In line with the national guidelines, the State of Chhattisgarh has prepared its SAPCC, with sector-specific strategies. ***The most pertinent climate change risks to the State include rainfall variability, increased periods of drought and rise in temperature. Spatial distribution of rainfall is also projected to become relatively skewed.*** Key challenges for the forest sector of the State would include degradation and loss of forest cover from potential forest fire risks increased by projected rises in temperature, longer drought spells with potentially significant impact on forest-dependent communities. Therefore, forest development & protection, regeneration and engagement with local communities are important areas of ongoing as well as proposed activities for the sector.

Analysis of public expenditure for climate linkages

Given the scope of climate change impacts on the State and the importance of addressing the same, ***steps should be taken towards integrating these concerns into the Government's planning and budgeting processes.*** An important step in this effort is the application of its Climate Change Financing Framework (CCFF) on public budgets – this helps the government ***identify and prioritise areas of intervention that are critical from a climate change perspective.*** The current analysis proposes that deliberations on climate resilience building and climate proofing of interventions become an integral part of the government's annual budgeting decisions.

The fundamental premise of undertaking this exercise is two-fold:

- 1. While most ongoing programmes in Departmental budgets may not have an explicit focus on climate change, their implementation could potentially yield climate co-benefits – these are opportunities for resilience building that should be identified.**
- 2. If future climate projections were not taken into consideration in ongoing and new programmes, then the intended benefits would be significantly reduced due to adverse impacts of climate change – these are areas to improve the preparedness to future CC risks, i.e. for climate proofing.**

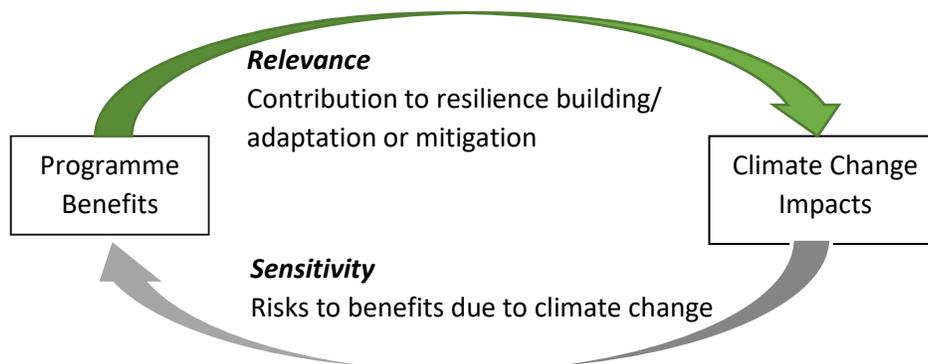
Therefore, the Climate Change Impact Appraisal (CCIA) is being proposed as a prioritisation tool to support the government in analysing and re-orienting its budget to improve the climate resilience of the community and infrastructure. CCIP has conducted this appraisal for three key sectors: Water Resources, Agriculture and Forestry: this report presents the CCIA results for the Chhattisgarh Forest Department.

Methodology – The Phased CCIA

The Phased CCIA is an assessment tool that involves an analysis of the benefits of programmes for their linkages with climate change factors (such as projected rise in temperature, erratic precipitation pattern, high intensity floods, longer drought spells etc.). The CCIA identifies 2 dimensions of programme benefits: the climate relevance and climate sensitivity (shown in Figure 1):

1. Climate change relevance: the potential contribution of the benefit to improving CC resilience or mitigation outcomes
2. Climate change sensitivity: the extent to which the benefit is affected by CC risks of the region being analysed

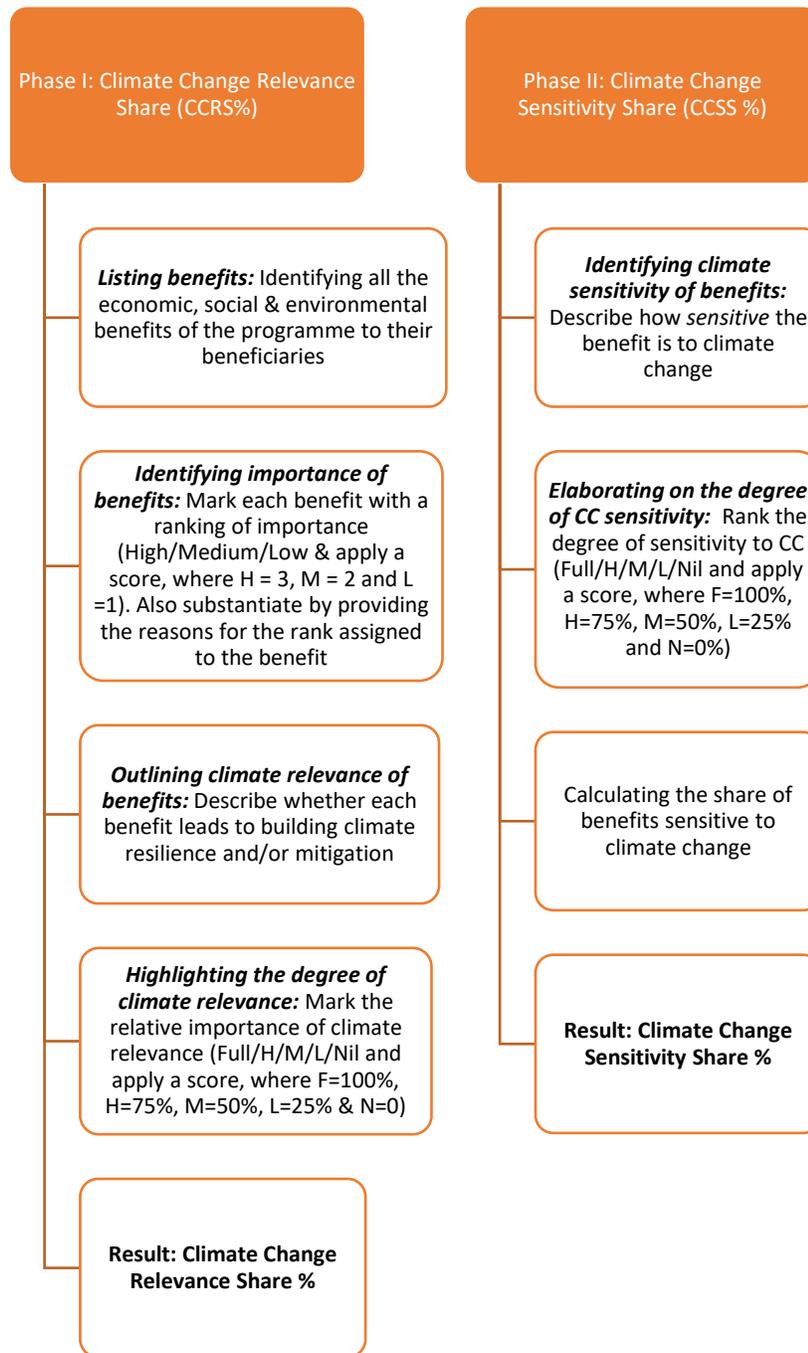
FIGURE 1: Climate Change Relevance and Sensitivity



Programmes/interventions with high CC relevance are valuable because of their default contribution to building CC resilience, and hence are good practices to be retained (and also funded on a sustained basis). High CC sensitivity in programmes relates to components that require some form of proofing effort (design level changes that would help reduce or eliminate adverse CC impacts). It is important that these interventions are funded only with special attention to such proofing – otherwise this investment would be at risk from future CC-induced losses and damages.

A summary of steps involved in conducting a Phased CCIA is shown below, and a detailed version is provided in Annex 1.

FIGURE 2: Steps in Phased CCIA



Source: Climate Change Innovation Programme, 2018

Table 1 shows the various possible combinations of CC relevance and sensitivity that may arise from the Phased CCIA, along with key policy recommendations. Based on time and resource availability, planners could adopt the appropriate response strategies for programmes in each of the four categories.

TABLE 1: Matrix of climate relevance and sensitivity

Phased CCIA Score		Climate Relevance (resilience building/adaptation/mitigation)	
		High	Low
Climate Sensitivity (loss and damage due to floods/cyclones/droughts)	High	A high priority for scrutiny: Retain benefits with <i>positive</i> climate sensitivity Climate-proof benefits with <i>negative</i> sensitivity	Design changes to enhance climate resilience and also more climate proofing effort to insure against welfare losses from climate hazards (in case of negative sensitivity) In case of <i>positive</i> sensitivity, enhancing climate resilience would reap dual benefits
	Low	Climate change benefits accrue with relatively less impact (or loss) from climate risks – low hanging fruits	Regular monitoring and review effort – To explore the future scope of mainstreaming climate concerns. Comprehensive assessments needed to evaluate allocations in such programmes

Source: Climate Change Innovation Programme, 2018

Results for the Forest Sector

The Chhattisgarh Forest Department has a total budget of INR 1563.93 crores for the year 2018-19 (Budget Estimates). The Plan outlay accounts for 47% of this, and the top 10 schemes among this have been considered for further study (shown in Table 2).

TABLE 2: Top 10 Schemes included in the analysis

S.No	Scheme Number	Scheme Name	Budget Estimate 2018-19 (in INR `000)
1	2962	Rehabilitation of degraded forests	1210000
2	7261	National Afforestation Programme	978970
3	2533	Hariyali Prasar Yojana	630000
4	2965	Rehabilitation of degraded forests (including bamboo forest)	503700
5	6724	Revival of bamboo forests	467900
6	3730	Project tiger	262400
7	6699	Expenditure from Forest Development Fund*	250000
8	6827	Groundwater and water conservation work	233000
9	5538	Integrated Forest Protection Scheme (CSS)	197620
10	5231	Grant to Minor Forest Produce Federation	190000

* Based on the current year's description of activities; scope of work varies year on year, based on local DFOs' proposals

The following points are important to note in the context of selection of schemes for the current analysis:

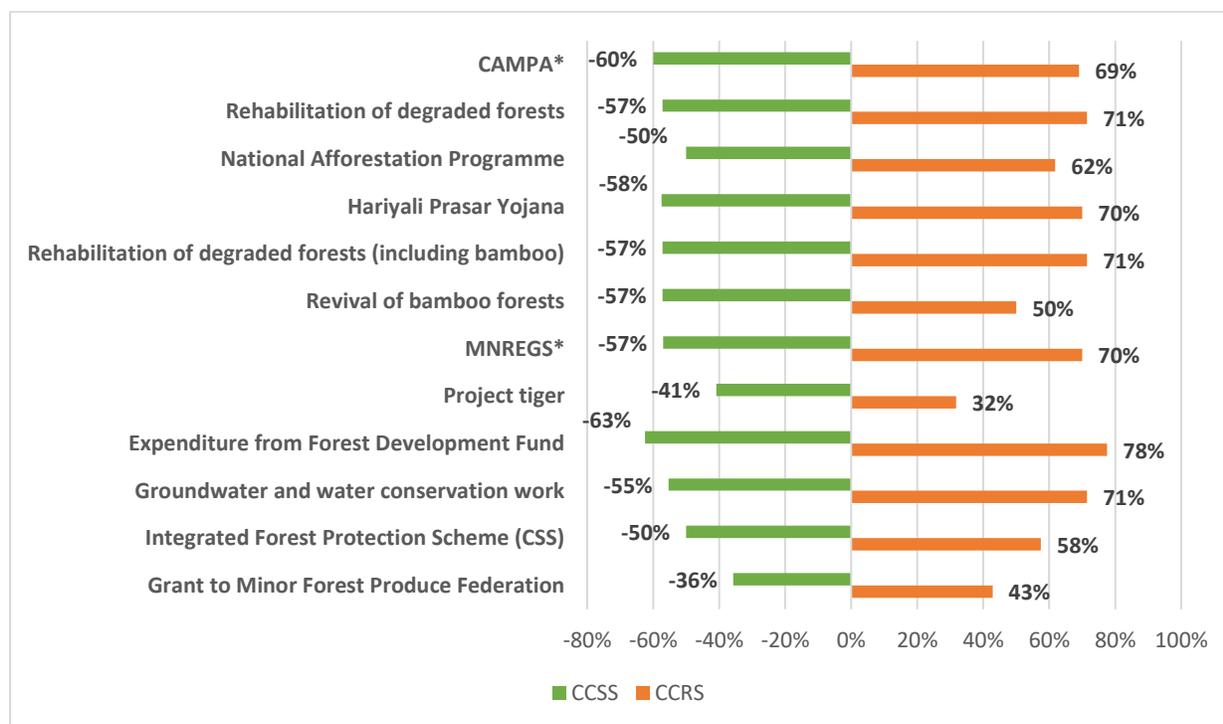
- The scope of this analysis is only the top 10 schemes of the Department budget – this has been done to demonstrate the Phased CCIA approach and familiarise planners in the government of the application of such a prioritisation tool.
- Moreover, these 10 schemes constitute 67% of the Plan outlay, hence covering a significant part of the Plan budget.

It is observed that the selected schemes primarily relate to increasing and conserving forest cover (with specific focus on bamboo in certain schemes), soil and water conservation, investment in fire protection and monitoring infrastructure, biodiversity conservation and livelihoods of forest-dependent communities. A few observations from the analysis are given below:

- Highly climate relevant components provide benefits such as improved forest cover (therefore sequestration benefits), reduced soil erosion, enhanced soil moisture content, fire protection etc. Schemes that deliver these benefits include Rehabilitation of degraded forests, Groundwater conservation and Hariyali Prasar Yojana, and have a relatively high CCRS.
- Schemes that involve revival and rehabilitation of degraded (and bamboo) forests, and plantation also have a high climate change sensitivity¹ because of the potential risks from longer drought periods and increased temperature. These factors would limit the ability to regenerate forest cover and restore soil moisture content, as well as increase vulnerability to forest fires. Therefore, there is a need to include such risks into planning so that these expenditures provide optimal results to the intended beneficiaries.

Figure 3 shows the CC relevance and sensitivity of these ten schemes graphically, for comparison.

FIGURE 3: Phased CCIA Results: Forest Sector



* CAMPA and MNREGS are outside the Forest Department’s budget, and their relevance to this analysis is discussed below.

¹ It may be noted that while the Phased CCIA approach provides for assessing the *positive* sensitivity of programme benefits, these were very few and small in scale, as observed from the analysis. Therefore, the more significant *negative* sensitivity to CC risks have been highlighted here, as well as in Figure 3 – to focus on the need for climate-proofing, which is the primary objective of this exercise.

Scope of Climate Mainstreaming beyond Departmental Budget

While this exercise has studied the top 10 schemes *within* the Chhattisgarh Forest Department Budget, it was also observed that substantial funding is routed towards important conservation and afforestation efforts through other channels, such as the CAMPA and MNREGS. For instance, the expenditure through CAMPA in 2017-18 was INR 223.62 crores, which is almost twice the outlay of the scheme with highest allocation in 2018-19 within the Department budget, namely, Rehabilitation of degraded forests. Similarly, the amount sanctioned in 2017-18 under MNREGS for the Department was INR 44.13 crore, which is greater than the individual allocations for 5 of the 10 top schemes chosen for this analysis.

A Phased CCIA was undertaken for these 2 programmes (their results are included in Figure 3 above) and showed that their relevance and sensitivity to climate change factors are very similar (and almost among the highest) to the schemes within the budget. The CAMPA funds a combination of activities relating to afforestation, biodiversity conservation, forest protection and improved management practices. The MNREGS directly contributes to works of plantation, watershed structures and water conservation. These are very significant in supporting the main objectives of the Forest Department as well as enlisting local community support in sustaining its forest management strategies.

Therefore, it becomes important to expand the scope of such an appraisal of programme components with the purpose of mainstreaming climate change concerns, even beyond the budget items, should there be significant space for decision making by the concerned Department on fund utilisation.

Way forward: Climate Proofing of top three climate-sensitive schemes

From the above Phased CCIA analysis, the top three most climate sensitive schemes are chosen for further scrutiny: to provide indicative guidelines for their climate proofing. Given the high climate sensitivity, these programmes require urgent policy attention (mainly in the form of climate proofing, as suggested in the top 2 quadrants of the matrix in Table 1). These schemes are:

1. 6699 – Expenditure from Forest Development Fund
2. 2533 – Hariyali Prasar Yojana
3. 2962 – Rehabilitation of degraded forests & 2965 – Rehabilitation of degraded forest (including bamboo forests) (these two schemes are very similar in scope, hence also have identical CCRS and CCSS scores)

A summary of the Phased CCIA for these schemes is provided in Annex 2, while detailed analyses of benefits are separately provided in worksheets. The next step is to outline a set of proofing suggestions that could be considered by the concerned programme officers of the Water Resources Department for future planning w.r.t these schemes, such that their climate sensitivity is *reduced*, and their climate resilience is *enhanced*.

Climate Proofing Guidelines for the Forest Sector

Chhattisgarh Forests (including trees outside Forests) need to be managed in the future in such a way that their climate sensitivity is reduced, and their climate resilience is enhanced. Some of the challenges before the department are:

- Keeping millions of hectare of forest lands by allowing trees to die of age and disease, creating little employment and little incomes, cannot earn people's support for keeping 44% of land under forest cover
- Poor productivity of these forests is one of the biggest challenges confronting the department
- There is a need to look at forestry as both an ecological and an economic resource for the welfare of the local population. To achieve this, it is important to bring focus back to comprehensive forestry in which economic productivity and returns from the forests should get equal weightage as ecological benefits
- Increasing demand for mitigation of climate change through carbon sequestration is the need of the hour as India gears up to meet its INDC commitments. This might pre-empt changes needed in forestry practices. This entails immediate and intensive steps to reduce the vulnerability of forests and forest dependent communities
- It is the right time to take appropriate steps for increased carbon sequestration and storage coupled with enhanced welfare from the forests and enhanced levels of consumption of forest goods and services over time
- Constant or increasing stocks of all forest capital (natural+ plantation+ human) over time with natural capital not dipping below critical levels for any ecosystem

Considering the above, the following Climate Proofing Guidelines are proposed for the Forests of Chhattisgarh:

1. Interventions to keep forests young and vigorous

- Since adaptation is best possible in younger tree crops - greater resistance to diseases and pest attacks, less vulnerability to fires - significant reduction in rotation age across species will favour adaptation.
- Chhattisgarh has mostly Sal, Teak and miscellaneous forests where at present harvestable girth in most working circles is kept very high. For example, in selection-cum-improvement working circles for Sal it is 120 cm, Site Quality II/III, age 100 years, diameter at breast height (dbh) 38.1 cm, average height 24.99 meters and average Mean Annual Increment (MAI) 5.04 cubic meter/ha. Chhattisgarh has a serious threat of recurrence of the Sal Borer epidemic. At 70 years Sal trees are, by general consensus, affected by Sal borer attack. Sound health of the Sal trees up to 70 years age is a good insurance against this pest. Therefore, the department might consider harvesting Sal at 70 years with average dbh 30.2 cm where it will be free from disease and fetch good price in market. This is also the age where the growth of the trees just begins to taper. Hence, this will also enable faster carbon sequestration and increased production of wood.
- Intensive thinning regimes should be adopted and in no case they should be kept pending for lack of budget. All pending mechanical/silvicultural thinning should be completed within 2/3 yrs. Interventions should be suitably provided for through modifications in the budgetary schemes. Special provisions in working plans should be made for hygienic thinning in forests prone to insect and pests.

- Marking trees for felling is a highly technical job and keeping the sensitivity of the issue in affecting the age and general health of the forest, felling should be approved at senior levels preferably the CCF in charge of a Circle.
- The above will require changes in working plan norms in the Chhattisgarh Working Plan Revision Manual, 2012, Page 201

2. Changing planting techniques in open forests

- Since most of the Restoration of Degraded Forests (RDF) work is carried out in degraded and open forests, the tendency currently is to leave a large number of trees which are eligible for harvesting in apprehension that it would create openings. Hence, heavy removal of dead and dying trees is required to reduce vulnerability to pests and fires and ensure health of the forests.
- 28% open forests remain without much intervention because planting small seedlings does not succeed. It is essential that tall sturdy saplings 2-3 m tall of desired species (mostly indigenous) should be planted in small openings as in China and many other countries. Costs are higher than planting seedlings but that have higher success rate and hence lower lifetime costs. The costs are also becoming increasing affordable with time.

3. Experimenting with different silvicultural systems

- A silviculture system no longer in vogue, Coppice with Standards (CWS)², could be adopted in Sal forests heavily infested with Sal borer on a small scale on experimental basis. Standard Sal trees left should be those found unaffected by the borer attack amidst heavy infestation
- All healthy non-Sal species, particularly *Terminalia* species with high NTFP value, should be retained in higher % as standard, so that the post-coppice crop veer more towards a mix of non-Sal species

4. Greater renewed emphasis on soil and moisture conservation measures

- Chhattisgarh has become prone to repeated droughts and there is a trend towards lower precipitation and higher temperatures. Thus, reducing surface runoff and increasing soil moisture are crucial for increasing productivity
- A wide range of locally suited soil moisture conservation measures should be adopted including stone and vegetative check-dams and contour trenches on slopes. A pilot local level micro-planning activity undertaken in Chuhari village under the National Adaptation Fund project may be referred for conducting the micro-planning exercise at the local level³.
- Already practiced in watershed areas, investment in soil and moisture conservation measures would have to be significantly higher and such higher provisions have to be made in regular RDF schemes so as to cover the entire area and not spread such measures thinly as is practised presently due to lack of sufficient budget. Hence, either the budget provisions for RDF needs to

² Coppice-with-standards (CWS) is an ancient forest system in Europe which served for centuries to provide timber and a number of other goods, like firewood, poles and fodder to the society while maintaining a continuous forest cover. Since the dawn of modern forestry, the area of coppice and CWS forest in Germany has constantly decreased. With the recent rise of energy prices and of wood as a renewable source interest in this system aroused again. Also, it was found that CWS forests because of their diversity in structure are a precious habitat for rare and endangered animal and plant species in comparison with high forests.

³ Details available with the State Centre for Climate Change

be increased or the planning for RDF schemes needs to consider phase-wise prioritising of areas to be taken up under RDF.

- Mulching top soil around young plants (both of natural origin and planted) and on severely exposed sites should also become an important part of these measures even though mulching may lead to increased CO₂ and CH₄ emissions.

5. Weed eradication combined with aggressive replanting

- Chhattisgarh forests are extremely prone to weed infestation by Lantana, Parthenium and several other species. Past attempts to reduce infestation have not succeeded primarily because the aggressive rebound of the weeds was not taken into account. Also, since most of these species are rapid coppicers, efforts to completely uproot these species is a must.
- Arresting this rebound should be at the core of weed removal strategy and this would include deciding on the time of removal before seeding combined with dense planting of very tall well-established plants of rapidly growing big leaf species that cast dense shadow on the ground.
- Intense maintenance work requiring large manpower is needed to ensure success of these efforts for at least 5 years after the planting.
- The local population should be encouraged to remove this weed biomass from the forest floor and use it as fuel or manure to reduce its greenhouse gas emission potential.

6. Adapting to increased fire incidences

- Chhattisgarh is covered by the Forest Fire Monitoring System of the Forest Survey of India. Here daily forest fire alerts are forwarded to the state and its staff directly everyday through a KMZ file that gives the fire polygons of Chhattisgarh. It is a Google compatible file that automatically loads on Google Earth. The Fire Information System is technologically quite advanced but both the field response mechanism and preventive measures leave much to be desired because of lack of resources. Thus, they require some additional budgetary allocations.
- The Working Plan Manual prescribes 3 tier classification for fire protection –
 - **First Class forests** afforded highest protection with emphasis on prevention - fire lines ranging from 30 meters wide old fire lines to merely 3 meters wide along roads/boundaries. This class includes plantations for 10 years after planting, watershed areas for ten years after soil conservation work, felling cycles for ten years after harvesting, bamboo flowering areas for ten years after the flowering is over besides nurseries and seed orchards that are to be afforded complete protection against fires on permanent basis.
 - **Second Class forests** are those worked regularly but not classified under First Class and given forest fire prevention treatment subject to availability of adequate funds after the implementation of preventive measures in forests under the First Class
 - **Third Class forests** are remaining forests and no preventive measures are undertaken and are only subjected to fire extinguishment

A far more intensive fire management is needed in Chhattisgarh because of increased forest fire risks with increased temperatures and lowered precipitation. It is becoming increasingly very difficult to douse fires once they begin.

- Therefore, it is necessary to completely revamp the fire prevention system as given in the working plans. Massive addition of fire lines network to include all classes of forests with adequate width in fire prone areas is a must. These lines should be of high quality and should be religiously and regularly maintained. Also, regular watch by an independent agency, preferably through a satellite-based system should be put in place to ensure compliance.
- Efficacy of different widths of fire lines requires re-examination in the light of the fire incidences that occurred in the past ten years.
- The Chhattisgarh Forest department is not adequately equipped and their ability to respond to the fire incidences is generally modest across the state and relies too heavily on legal duty cast on people living close-by and are members of the JFM committees. This is not an efficient system for such an important task and in most areas, it no longer works inspite of these committees getting a lot of funds for such work. This is a work which ought to be paid in full directly by the department to be able to draw people to undertake this extremely arduous and risky task and pay them directly for this fire-fighting work.
- Quick response teams with members drawn from local communities with adequate mobility and equipment to douse fires need to be set up across the state. All these activities should create very substantive employment and ensure protection and conservation of the forests and help enhance their productivity and carbon sink potential leading to achievement of the INDC targets committed by India to the UNFCCC.

7. Interventions to encourage community forestry

- There is waning interest in JFM forests in many areas due to low economic returns to the fringe forest area communities. The problem is more serious in forests with limited NTFP. There is need to rekindle community interest in forests which is crucial to both mitigation and adaptation.
- There is a dire need of massive increase in investments to promote the production and harvest of NTFPs. This can be ensured by diverting some funds for forests conservation and protection from the Profits of the Chhattisgarh Minor Forest Produce Federation (as was done in the past with 15% being given to enhance forest productivity). This will ensure sustained development of NTFPs in the forests and consequently ensure better returns to the dependent communities.
- There is dire need to rethink management of forests near villages as village forests that will ensure better Timber and fuel wood harvest that is almost non-existent presently. A greater emphasis and investment on scientific and intensive Assisted Natural Regeneration (ANR) in these degraded forests can be a solution.

8. Enhancing Tree outside Forests (TOF): Harmonizing Markets and marketing regulations to increase confidence for TOF in Farmers and other stakeholders

- Even though several steps have been taken by the forest department to encourage development of private forests and trees outside forests, yet the confidence is lacking in the people to grow trees on their private holdings. This is mainly because of faulty and complicated laws and their implementation. The complicated procedure and constant change of rules of felling of trees has made people to lose confidence and most are afraid of the long-drawn procedures of felling and transportation of felled timber and the unstable market for such timber and forest produce. This discourages tree planting by both private and also public departments other than forest department.

- Thus, fundamental changes are required in the way we see trees outside forests and it is necessary to build confidence in people by not only relaxing both felling and transportation rules but also ensuring they are implemented by the concerned frontline staff in real spirit to encourage tree planting outside forests and meet the INDC and Green India Mission's ambitious targets.
- The forest department need to revisit and re-examine all the amendments and conflicting laws and rules with respect to planting trees outside forests and make clear and easily implementable laws and rules setting aside all conflicts in different laws and rules so that the people adopting tree cultivation are not harassed. It also has to be ensured that since tree farming is a long-term effort, laws and rules are not changed frequently or with retrospective effect
- For private tree farming to be encouraged it is necessary that these forests must be managed not only in an ecologically sound manner but also on a sound economic basis. This entails a sustained an efficient marketing structure to ensure adequate rates to the tree growers at harvesting. This has to be done by the forest department to ensure the farmers are not taken for a ride by middlemen or the industrialists, who are the end-users of such a produce.

9. Creation of large jobs for fringe forest area communities in the forestry sector to enable them to adapt to changing climate:

- If given proper investments for intensive forest management, there is huge scope in creating new full-time jobs in afforestation, desertification control, conservation, fire management, pest management, indigenous forest management, watershed, improvement in productivity of existing planted forests, agro-forestry, urban and peri-urban forestry and skill improvement in forestry and wood industry. The above approach will create massive employment in the forestry sector all round the year.
- Protection and conservation activities like demarcation of boundaries, maintenance of inspection paths and roads recreational activities, ecotourism and creating/managing nature education centres also have a huge potential for job creation. In effect, the forest has to be seen as a means towards economic well-being of local population to maintain the forests.

10. How REDD+⁴ could work in tribal areas of Chattisgarh

- 1.7 Mha of open and 3.74 Mha of MDF in which carbon density can be enhanced by fire prevention, pest and disease management, invasive species management, gap seeding and planting
- These activities require trained staff for short periods but the department does not have adequate staff. The temporary and discontinuous nature of work does not lend itself to regular forest staff. A large workforce of temporary staff will be required for intensive forest management. Therefore, engaging suitable tribal youth from neighbouring communities as Community Forest Officers, and training them under MRV provisions of REDD Plus and using

⁴ Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) was negotiated under the United Nations Framework Convention on Climate Change (UNFCCC) in 2005, with the objective of mitigating climate change through reducing net emissions of greenhouse gases through enhanced forest management in developing countries.

their services for 5 months in a year will ensure not only local employment but also conservation of our forests.

- These temporary CFOs shall work under Ranger and get paid from REDD+ funds. It will also develop a sustained love in the communities in conservation and protection of the forests and they will engage directly in forest management and yet the forests shall have the benefit of technical management by forest department. This will be the real Joint forest Management where both the forest department and the communities will stand to benefit.
- This would be in addition to some part of REDD funds that will go to the communities directly.

ANNEX 1: PHASED CCIA – DETAILED STEPS

Listing and scoring the benefits:

- Describe (and discuss among yourselves) the activities/ scope of the scheme as well as the most pertinent risks of the climate scheme being analysed
- List all the benefits of the scheme, including development and climate relevant benefits. Include any major spillover or co-benefits of the programme, even if these are not explicit objectives of the scheme objectives (Column 1)
- Assign the degree of importance of each benefit (H/M/L) and score them as 3,2,1 respectively (Columns 2 & 3). Give the reason of the classification in the matrix (Column 4), for better understanding. Total up these scores.

Guide to scores:

High = 3

Medium = 2

Low = 1

Phase I - Climate Change Relevance:

- Describe whether the benefit can contribute towards CC resilience building or CC mitigation, with specific reference to CC factors identified in Step 1 (Column 5).
- Assign the degree of CC relevance (F/H/M/L/N) at (100% ,75% ,50% ,25% ,0 %) respectively (Columns 6 & 7). Ask the question: How strong is this benefit in contributing to CC resilience/mitigation? Give the reason of the classification in the matrix, for better understanding.

Guide to scores:

Nil = 0% (No scope/link with CC resilience)

Low = 25% (Very limited/marginal significance to CC)

Medium = 50% (Moderate linkage to CC resilience)

High = 75% (Predominant factor in contributing to CC resilience)

Full = 100% (Benefit has value only in the event of CC – e.g. mitigation outcomes)

Assess the parameters/factors that help building climate change resilience and decide how prominent each benefit is?

i.e. the more exclusive the benefit is, in contributing to CC resilience/mitigation, the higher its CC relevance. *List the CC relevance scores by comparing the importance of the benefit in the climate change scenario as compared to the non-climate change scenario.*

- Calculate the Climate change Relevance Share (CCRS) of benefits (Column 8) as:

CCRS = Degree of Relevance (Benefit score) * Total of degree of CC relevance

CCRS = Column 3 * Column 7

Total the CCRS of all these benefits and divide by total of benefit ranks. This gives the combined CCRS of the scheme

Phase II - Climate Change Sensitivity:

- Describe the risks from CC to each benefit (Column 9).
- Assign a score of (F/H/M/L/N) comprising 100%, 75%, 50%, 25% and 0 respectively (Columns 10 & 11). Ask the question: How exclusive are the risks to this benefit because of the climate change as compared to other factors? How strongly will the benefit be impacted in a climate change scenario as compared to the non-climate change scenario?

Note: Always consider the benefit through the context of the specific scheme: Not as the Generic/Sectoral phenomenon, independent of the scheme context.

Give the reason of the classification in the matrix, for better understanding.

Guide to scores:

Nil = 0% (No sensitivity to climate change impacts)

Low = 25% (Very limited/marginal sensitivity to CC impacts)

Medium = 50% (Moderate sensitivity to CC (CC is among the many factors that could affect this benefit, but not the dominant one)

High = 75% (Predominant sensitivity to CC i.e. CC impacts are likely to cause more damage than any other factors)

Full = 100% (The benefit is ONLY exposed to climate change risks, and not any other factor)

- Calculate the CC Sensitivity Share of the scheme (CCSS) of benefits (Column 12):

Rank of Importance of benefits (Benefit score) * Degree of importance of CC sensitivity

CCSS = Column 3 * Column 11

Total the CCSS of all the benefits and divide by total of the benefit ranks. Thus, CCSS of the scheme is the addition of CCSS of all the benefits

ANNEX 2: Phased CCIA Results of most climate sensitive schemes in the Forest Sector

TABLE A.1: Scheme 6699: Expenditure from Forest Development Fund

Sl. No	Benefits of the Project (including CC Benefits)	Relative importance of Benefit (H/M/L)	Score	Reason for benefit score	Climate resilience building and/or mitigation relevance	Relative Importance of climate relevance (F/H/M/L/N)	Score	Climate Change Relevance Share	Nature of sensitivity of benefit to CC	Relative importance of climate sensitivity (F/H/M/L/N)	Score	Direction	Climate sensitivity score
1	Increase in green cover from plantation activities	H	3	These are the main outcomes targeted from plantation and afforestation activities	This has a direct mitigation effect	F	100%	3	The ability for forest cover to mature as carbon sinks would be impacted by survival rates and species composition - these are likely to be impacted over a period of time due to CC factors	M	50%	Negative	-1.5
2	Improved soil moisture content from plantation efforts	H	3		This supports tree cover over a period of time	H	75%	2.25	This could be immediately affected by droughts/erratic rainfall (shorter term risk, than longer term forest growth)	H	75%	Negative	-2.25
3	Reduced soil erosion from afforestation	M	2	These are benefits realised over a period of time	This supports tree cover over a period of time, but also helps retain soil moisture content in the short to medium term	H	75%	1.5	This could be immediately affected by floods (shorter term risk, than longer term forest growth)	H	75%	Negative	-1.5
4	Reduced degradation of land from conservation efforts	M	2		This contributes to #1 above	M	50%	1	Climate change is among various factors that affect land management, especially for improving forest cover (hence given a moderate score)	M	50%	Negative	-1
Total			10	Total			7.75	Total			-6.25		
CCRS								78%	CCSS				-63%

TABLE A.2: Schemes 2533: Hariyali Prasar Yojana

S.No	Benefits of the Project (including CC Benefits)	Relative importance of Benefit (H/M/L)	Score	Reason for benefit score	Climate resilience building and/or mitigation relevance	Relative Importance of climate relevance (F/H/M/L/N)	Score	Climate Change Relevance Share	Nature of sensitivity of benefit to CC	Relative importance of climate sensitivity (F/H/M/L/N)	Score	Direction	Climate sensitivity score
1	Improved farm incomes from fruit bearing species	H	3	This is the primary targeted outcome of the scheme	This contributes to income resilience of farmers, especially beneficiaries from the SC/ST categories	H	75%	2.25	This is likely to be impacted by the vulnerability of approved species in the programme (to CC risks of drought and erratic rainfall). Most of these species are less water intensive, hence moderate sensitivity assigned	M	50%	Negative	-1.5
2	Increased productivity of land	H	3	This programme focuses on non-agricultural lands, hence this is a direct outcome		H	75%	2.25	This is highly impacted by climatic factors, so benefits from financial support may be limited	H	75%	Negative	-2.25
3	Improvement in soil fertility (from cultivation), and moisture content	M	2	This is an associated benefit from #2 above	This supports cultivation and hence helps sustain farm incomes (similar to #1 above)	H	75%	1.5	This could be immediately affected by droughts/erratic rainfall (shorter term risk, than longer term tree growth)	H	75%	Negative	-1.5
4	Improved market access from support to transportation included in the scheme	M	2	This is part of the financial support intervention	This contributes to farm income (cost-side)	M	50%	1	Physical access to markets may be impeded by floods etc. but otherwise this benefit is less sensitive to CC risks	L	25%	Negative	-0.5
Total			10	Total			7	Total			-5.75		
CCRS								70%	CCSS			-58%	

TABLE A.3: Schemes 2962: Rehabilitation of degraded forests & 2965: Rehabilitation of degraded forests (including bamboo forests)

S.No	Benefits of the Project (including CC Benefits)	Relative importance of Benefit (H/M/L)	Score	Reason for benefit score	Climate resilience building and/or mitigation relevance	Relative Importance of climate relevance (F/H/M/L/N)	Score	Climate Change Relevance Share	Nature of sensitivity of benefit to CC	Relative importance of climate sensitivity (F/H/M/L/N)	Score	Direction	Climate sensitivity score
1	Protection of existing tree cover	H	3	These are the main outcomes targeted from RDF interventions	This has a mitigation effect, from maintaining the current levels of sequestration	H	75%	2.25	CC risks of dry spells could limit this benefit, despite community efforts	H	75%	Negative	-2.25
2	Increase in green cover from plantation activities	H	3		This has a direct mitigation effect	F	100%	3	The ability for forest cover to mature as carbon sinks would be impacted by survival rates and species composition - these are likely to be impacted over a period of time due to CC factors	M	50%	Negative	-1.5
3	Improved soil moisture content from plantation and water conservation efforts	H	3		This supports tree cover over a period of time	H	75%	2.25	This could be immediately affected by droughts/erratic rainfall (shorter term risk, than longer term forest growth)	H	75%	Negative	-2.25
4	Improved availability of water from conservation efforts	M	2	This is part of the RDF interventions	This preserves a scarce natural resource, hence improves resilience during drought periods	H	75%	1.5	This is sensitive to erratic rainfall and drought spells, which are critical CC risks for the State	H	75%	Negative	-1.5
5	Sensitisation of local fringe communities on general	M	2	This is an important benefit, on which the	This is a facilitating factor in achieving the	L	25%	0.5	This is expected to increase with greater incidence of	L	25%	Positive	0.5

	environmental and forest preservation (by enlisting their cooperation and participation)			sustainability of RDF efforts largely relies.	above climate benefits				climatic events (however it is also influenced by other factors such as government initiative, budget outlay, politics, etc.)				
6	Incentives for local community participation (through JFMCs) - where local forest produce is distributed and employment provided	L	1	This is relevant only upon improvements in forest density, and is one of the means of securing local support	This has a moderate impact in encouraging local engagement in RDF efforts (indirectly contributes to above climate benefits)	M	50%	0.5	This is at similar risk as growth in forest cover itself (same as in #2 above)	M	50%	Negative	-0.5
Total			14	Total				10	Total				-8
CCRS								71%	CCSS				-57%



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