Inception Report

Monitoring and Evaluation (M&E) for PoCRA in Marathwada Region, Maharashtra

Submitted By

SAMBODHI

In Association With

teri The Energy and Resources Institute

Contents

1. Project Background

With agriculture being the primary source of livelihood in the state, Maharashtra has 22.6 million ha of land under cultivation (gross cropped area) and 5.21 million ha under forest. About 84 % of the total area under agriculture in the state is rainfed and is dependent only on monsoon[1]. 49 % of the landholdings in the state falls in marginal category, with less than one ha land. Most of these poor farmers with small and unirrigated land holdings are vulnerable to climate shocks. Moving these farmers out of the current crisis of high production cost, low profitability due to low productivity, lack of market access is one of the biggest challenge for the state. Also, the critical issues related to water scarcity, degraded land resources, increased cost of cultivation and the impacts of climate change need to be addressed to reduce the vulnerability and improve the profitability of the smallholder farmers.

To respond to the above mentioned challenges, the Government of Maharashtra, in partnership with the World Bank, has conceptualized the Project on Climate Resilient Agriculture (PoCRA) for about 5000 villages in 15 districts of Maharashtra. Through this project, the Government of Maharashtra along with the World Bank attempts to bring transformational changes in the agriculture sector by scaling-up climate-smart technologies and practices at farm and (micro) watershed level, that would contribute to drought-proofing and management of lands in states' most drought and salinity/sodicity-affected villages. The project focuses on smallholders (farmers up to 2.0 ha of farmland) with particular focus on vulnerable population whose livelihood is impacted by changing climate conditions and climatic uncertainties. The project will be implemented in 15 districts in Maharashtra which include 8 districts of Marathwada (Aurangabad, Nanded, Latur, Parbhani, Jalna, Beed, Hingoli, Osmanabad), 6 districts of Vidarbha (Akola, Amravati, Buldana, Yavatmal, Washim, Wardha) , Jalgaon district of Nashik Division and approximately 1000 salinity affected villages in the basin of Purna river spread across Akola, Amaravati, Buldana and Jalgaon districts[2]. The below figure highlights the villages where the project will be implemented. This project will be implemented over a period of 6 years from 2018-2024.

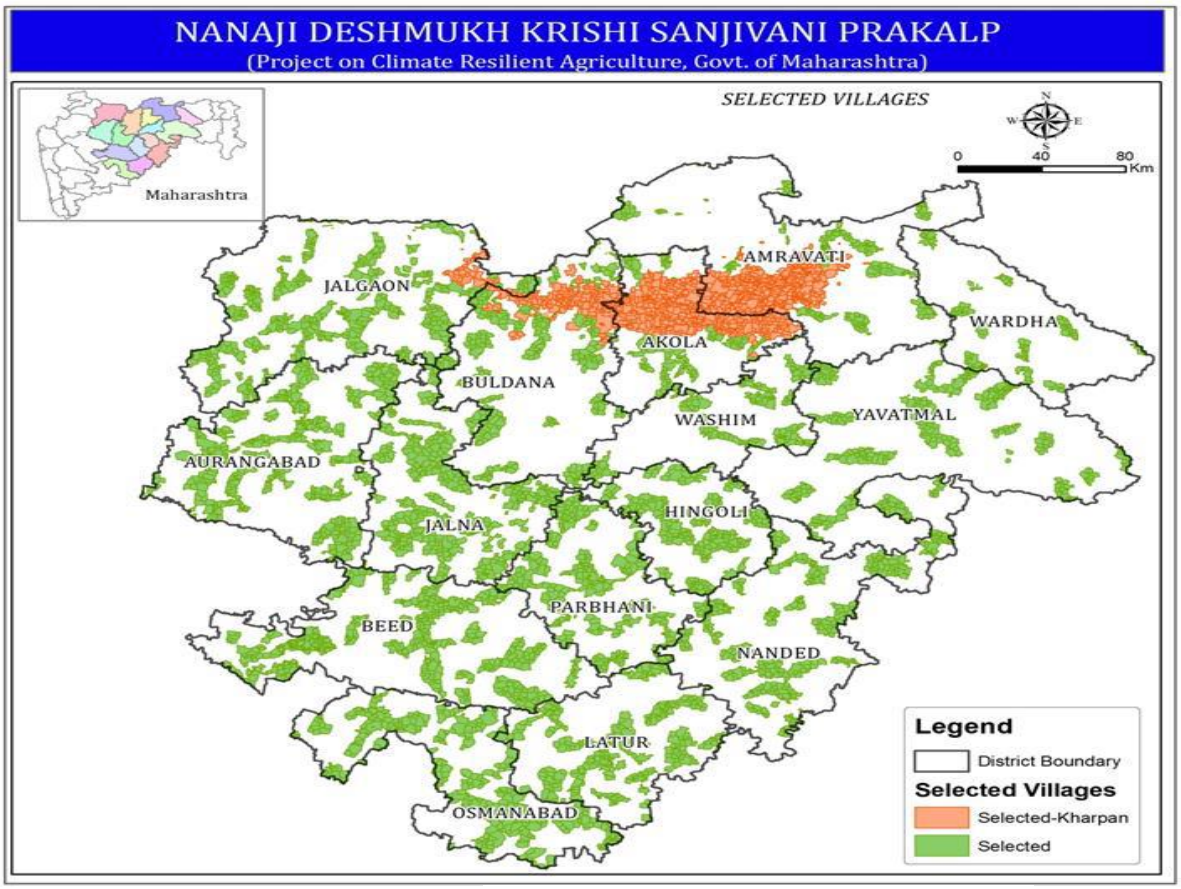


FIGURE 1:POCRA PROJECT AREA AND VILLAGES, Source: https://mahapocra.gov.in/

[1] Source: PoCRA Project Implementation Plan(PIP) document
[2] Source: Terms of Reference

The Project Development Objective (PDO) of PoCRA is to enhance climate-resilience and profitability of smallholder farming systems in selected districts of Maharashtra. The project is built around a comprehensive, multi sector approach that focuses specifically on building climate resilience in agriculture through scaling up tested technologies and practices. The strategic overview, thematic linkages and expected achievements of the project are highlighted in the below schematic.

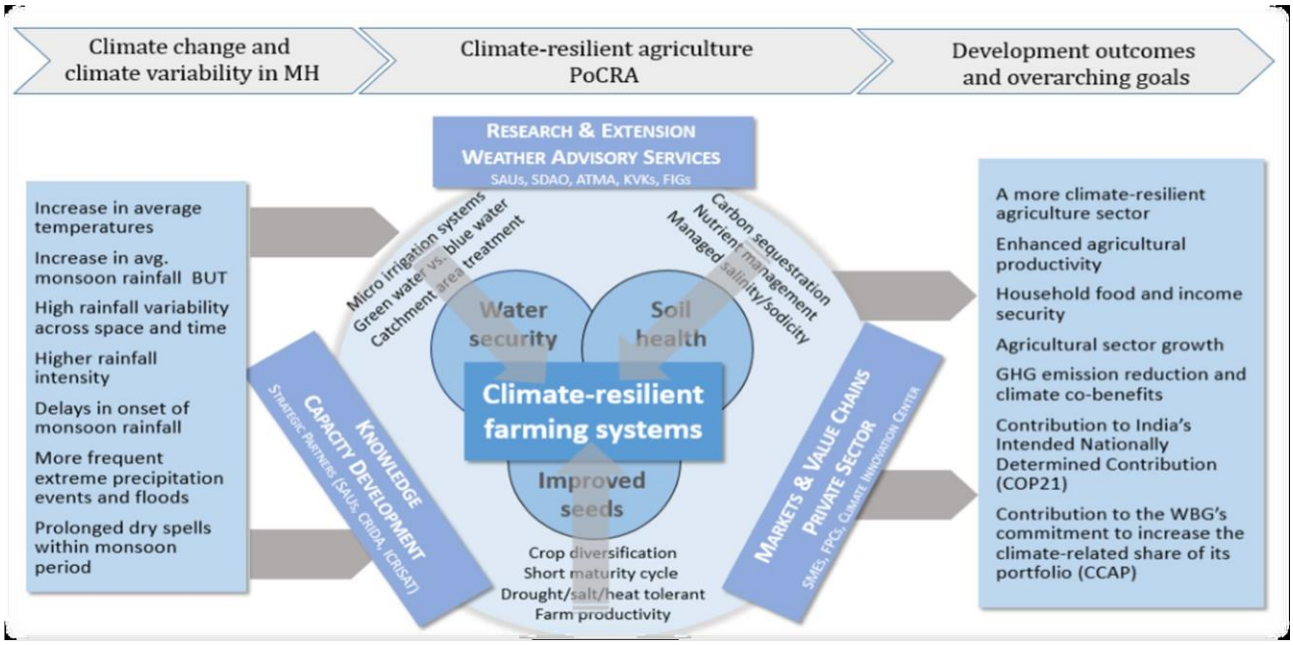


FIGURE 2:POCRA STRATEGIC OVERVIEW. THEMATIC LINKAGES AND EXPECTED ACHIEVEMENTS

Source: Project Implementation Plan(PIP) , PoCRA

The overall project vision is to contribute towards three critical impact areas: a) Water Security b) Soil Health c) Farm Productivity and Crop Diversification. The need for intervention across these three areas in the region is evident given the type of agro-climatic attributes of the area.

Of the 15 districts where PoCRA will be implemented, the current assignment is to be conducted in 8 districts of Marathwada region, covering 347 mini watershed clusters. The project will be implemented in a phased manner reaching out to 70 cluster in year I, 175 clusters in year II and 102 clusters in year III. The below table provides the detail of this phased implementation of the project in Marathwada region. The subsequent sections provides an overview of the demographic and agro-ecological attributes of this region while contextualizing the broader discourse of resilience.

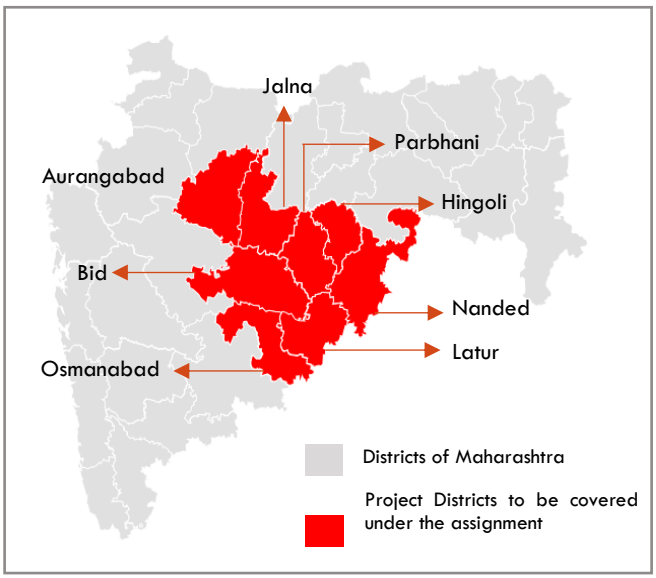


FIGURE 3: PROJECT DISTRICTS

TABLE 1:PROJECT PHASED IMPLEMENTATION PLAN IN MARATHWADA REGION

S.No.	Name of District	No. of talukas	No. of total villages	No. of project villages	Kharpan Villages	No. of project clusters	Phasing of Clusters			
							Y- I	Y- II	Y- III	Total
1	Aurangabad	9	1353	406	0	58	12	29	17	58
2	Bid	11	1368	391	0	37	7	19	11	37
3	Jalna	8	970	363	0	54	11	27	16	54
4	Latur	10	948	282	0	42	8	21	13	42
5	Osmanabad	8	732	287	0	58	12	29	17	58
6	Nanded	16	1603	384	0	34	7	17	10	34
7	Parbhani	9	843	275	0	39	8	20	11	39
8	Hingoli	5	711	240	0	25	5	13	7	25
		76	**8528**	**2628**	**0**	**347**	**70**	**175**	**102**	**347**

1.1 Overview of the Study Area

About one-sixth of the total topographical region in India falls under the Drought Prone Area (DPA) and about 40% of the Maharashtra State falls under DPA, with less than 750mm of the annual average rainfall[3]. In Maharashtra, Marathwada region specifically has been floundering under drought condition since 2012 with the highest rainfall deficit in the country at 48% in 2014. Marathwada region coincides with Aurangabad Division and consists of 8 districts namely; Aurangabad, Bid, Latur, Osmanabad, Parbhani, Jalna, Nanded and Hingoli.

The region has a population of about 1.87 Crores and a geographical area of 64.5 Thousand sq. kms[4]. Agriculture is the major source of income generation for over 64% of the state's population. However, given harsh weather conditions the region's agricultural system has been depleting significantly. Jowar and Bajra, along with other kharif crops, were completely wiped out in 2013 when monsoon failed. Jalna district, famous for being the biggest producer of sweet lime had been the worst hit in the drought. Two important cash crops in Marathwada namely cotton and sugarcane were also severely affected. The anticipated impact of climatic change as well as climate variability presumably lead to an increased pressure on already scarce water resources.

The government claimed 2012 drought to be worse than 1972, which was termed as 'famine'. While South Asia Network on Dams, Rivers and People (SANDRP), in its analysis claims that 1972 drought could be called a natural calamity, the 2012-13 drought was "a disaster of water management, accompanied by water-intensive cropping pattern and absence of long-term view to manage water and drought." Consequently, the drought situation of Marathwada region is not only the result of the erratic distribution of monsoon rain but also associated with lack of water governance, poor implementation of watershed development projects and non-judicious use of irrigational water.

Starting 2014, the Jalyukt Shivar Abhiyaan, one of the state government scheme started its intervention to make the state drought-proof by 2019. It aimed to make 5,000 villages free of water scarcity every year through deepening and widening of streams, construction of cement and earthen stop dams, work on nullahs and digging of farm ponds. A total of 158,089 water management works were to be carried out under this project, of which 51,660 have been completed till April 2018. This demonstrates that there is a need of more concentrated efforts for mitigation and adaptation with an aim to reduce vulnerability of agriculture and making it more resilient.

Within this context, there is an urgent need for the farmers to enhance their resilience to the threats of climate variability. The fact that most of famers in the project region are marginal, their adaptive capacity is very limited hence economically viable and culturally acceptable adaptation techniques need to be developed and implemented. The Government of Maharashtra has realized the implications of building climate resilience in the

[3] Hydrology and Water Resources Information System for India, National Institute of Hydrology, Roorkee http://nihroorkee.gov.in/rbis/India_Information/draught.htm

[4] Census 2011, http://shodhganga.inflibnet.ac.in/bitstream/10603/152935/11/11_chapter%204.pdf

agricultural sector and has developed a drought proofing and climate resilient strategy as a long term and sustainable measure to address the likely impacts of climate change. With this backdrop, the Project on Climate Resilient Agriculture (PoCRA) has been formulated by the Government of Maharashtra with support from World Bank. This is the first large scale climate resilient agriculture project in India which aims to enhance climate-resilience in agricultural production systems through a series of activities at the farm level.

1.2 Scoping the Project within a Climate Resilience Framework

Globally, agriculture development intervention in the climate change context has been appraised through Climate Smart Agriculture (CSA) of which Climate Resilient Agriculture (CRA) as a sub-set. Both the approaches are utilized to mainstream climate change adaptation to a geographic context and developmental implementation are planned likewise. CSA and CRA have much in common with sustainable agriculture, which promotes farming in ways that do not deplete natural resource over the long term and is based on ecological principles[5]. PoCRA and its implementation can be viewed within this purview which encapsulates aspects of mitigation and adaptation to increase resilience.

IPCC defines resilience, as '*the capacity of a social-ecological system to cope with a hazardous event or disturbance, responding or reorganising in ways that maintain its essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation*' (IPCC, 2014b). PoCRA's RFID elaborates on all of the aspects of resilience building, starting with enhanced climate resilient system, value chain promotion and mainstreaming climate-resilience in agricultural research and technical advisory services.

The project is also set to begin at a crucial stage where the policy undertaking around climate change call for action to limit global warming to 1.5 degrees Celsius requiring "rapid and far-reaching" transitions in land, energy, industry, buildings, transport, and cities[6]. PoCRA's contribution toward this shared goal of combating climate change through appropriate measures around CRA would be incremental and would be valuable with regards to painting a larger picture of how projects such as PoCRA can accelerate the change envisaged. It would also be worthwhile to locate the project with reference to its specific geographic focus and how similar strategies could be formed in the future.

Going by this approach, the project M&E needs to be looked at from a theory based approach. The proposal has been developed with this broader objective while also addressing the specific need and expectations as given in the ToR.

Detail on the specific program components and proposed design and methodologies will be discussed hereafter.

1.3 Program Implementation Components

PoCRA was envisioned to promote the following components:

1. ***Climate-resilient agricultural system:*** The activities comprises of creating participatory mini watershed plan, promote on-farm climate-resilient technologies and agronomic practices to enhance climate resilient development of project catchment area

2. ***Climate-smart Post-harvest Management and Value Chain:*** The project aims to strengthen and promote Farmer Producer Company (FPCs), strengthening emerging value-chains for climate-resilient commodities and improve the performance of the supply chain for climate-resilient seeds

3. ***Institutional Development, Knowledge and Policies for a Climate-resilient Agriculture:*** Through this component PoCRA aims at informing knowledge and policies around climate-resilient agriculture through platforms such as Maharashtra Climate Innovation Centre and also by strengthening institutional capacity for sustained project impact.

An elaborate project management process has been laid by the PMU to appropriately implement the project activities. Each of the components mentioned above has been decentralized and sub-components along with key activities are defined in-depth. The detailed components of the project have been mentioned in Annexures. Therefore, along with PMU it is expected that the evaluation team build the M&E approach drawing from the

[5] Pound B. et al. (2018) Climate-Resilient Agriculture in South Asia: An analytical framework and insights from practice, Oxford Policy Management

[6] IPCC 2018, Summary for Policymakers of IPCC Special Report on Global Warming of 1.5ºC. http://report.ipcc.ch/sr15/pdf/sr15_headline_statements.pdf

results framework and in consultation with the PMU. In addition, the PMU will also be responsible for meta-evaluation of M&E activities.

1.4 Scope of Work of the Assignment

The overall objective of the assignment is to conduct the monitoring and evaluation of PoCRA project for its implementation in 2628 villages in eight districts of Mathwada region. The M&E agency is responsible for carrying out the monitoring and evaluation of all project activities such that it creates insights on output and outcome indicators suggested within the Results Framework of the project as well as carrying out an impact assessment.

The objective of monitoring and evaluation are as follows:

1	Measuring and assess outputs, outcomes and impacts generated by the project activity over project duration
2	Assess input delivery mechanisms addressing quality, quantity and appropriate timings of such supply
3	Assess whether activities are reaching to the intended beneficiaries and provide recommendation to improve targets as well as service delivery mechanism
4	Identify gaps, if any, in the implementation of activities and components, so that PMU can create strategies and design tools for effective implementation
5	Promote accountability in allocation and utilization of resources across the project area and activities to strategize a transparent and participatory project implementation
6	Encapsulate experiences and contribute to learning, document best practices, practices and promote policy dialogue

FIGURE 4:OBJECTIVES OF M&E

As stated in the ToR, the Project Management Unit (PMU) of PoCRA will have the responsibility for planning and coordinating M&E activities for the entire project. Further, the M&E expert in the PMU will coordinate the M&E activities with the M&E Agency and will review the progress and conduct meta-evaluation of the M&E activities. The specific scope of work for the M&E agency under this assignment is to conduct impact evaluation which consists of baseline, midline and endline survey and also conduct bi-annual concurrent progress monitoring. The scope of work of the assignment also includes conducting the GHG assessment and the ESMF audit of the PoCRA project. The specific scope of work of the M&E support under the assignment has been presented in the below schematic.

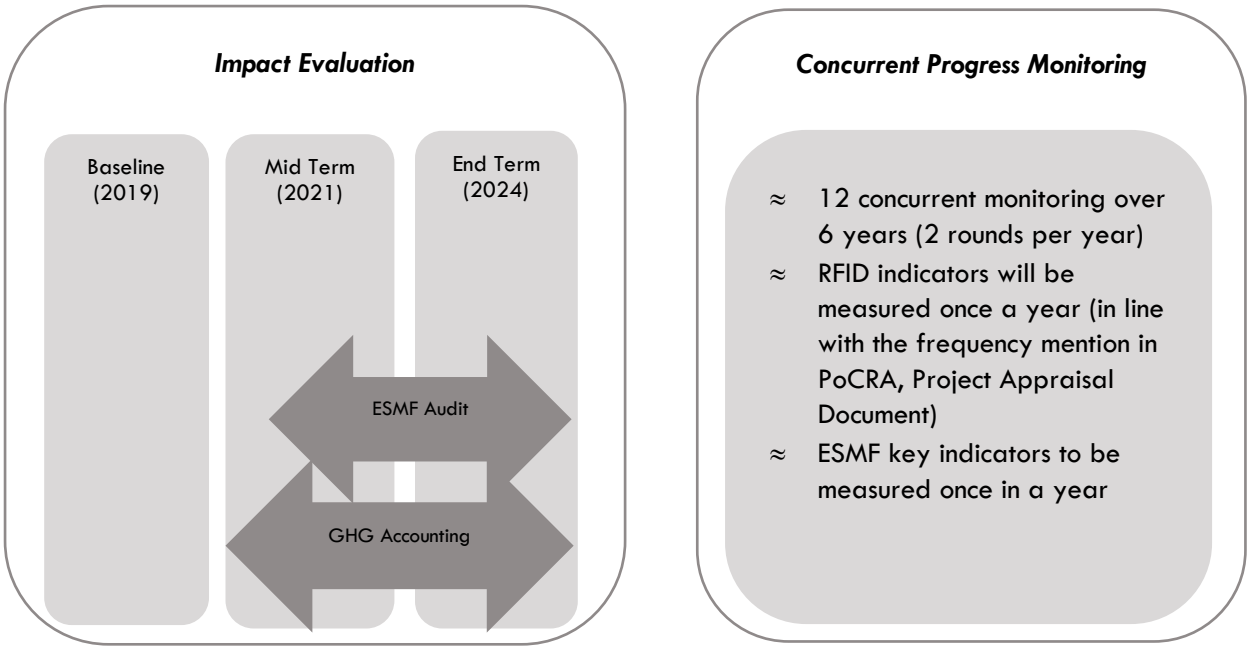


FIGURE 5:SPECIFIC SCOPE OF WORK OF THE ASSIGNMENT

The key deliverables that would be submitted as part of this assignment corresponding to the specific scope of work has been detailed below

i. Inception Report
ii. Baseline Report and Relevant Datasets
iii. Mid-term Assessment Reports and Relevant Datasets
iv. End-term Assessment Reports and Relevant Datasets
v. Assessment Reports for each Concurrent Progress Monitoring with the Relevant Datasets (total 12 concurrent monitoring reports)
vi. ESMF Report

2. Approach to Evaluation

The study will evaluate the overall PoCRA project performance as well as strengthen the implementation processes. The study will need to understand **'how'** the programme has contributed to the enhancing climate-resilient agriculture system; **'which'** aspects of the programme have contributed; and **'what'** impact, the intervention has had, on creating climate resilient agriculture system.

2.1 Theory Based Evaluation

The nature of the project as well as expectation from M&E necessitates the application of a **theory-based evaluation approach** to evaluation. Theory-based approaches to evaluation use an explicit **Theory of Change (ToC)** to draw conclusions about whether and how an intervention contributed to observed results[7].

PoCRA follows an explicit results framework approach to define outcome it wants to achieve. Incorporation of theory-based evaluations will prove to be highly relevant in the context where outcomes are assessed with the creation of logical results pathway. Most importantly, a theory-based approach will allow development of narrative around resilience both for agricultural system and human systems. Aligning the evaluation along this principle will also widen the scope to benchmark indicators around resilience with the acceptable global targets. The table below elaborates on the utility of the proposed approach in case of M&E.

[7] 3ie (2009) Theory-Based Impact Evaluation: Principles and Practice. http://www.3ieimpact.org/media/filer_public/2012/05/07/Working_Paper_3.pdf

TABLE 2:INCORPORATION OF THEORY-BASED EVALUATION APPROACHES TO RESPOND TO M&E OBJECTIVES

Study objective	Evaluation approach	Utility
Track progress of **PoCRA** against **RFID**	ToC based approach	ToC based approach will help identify yardsticks against program outcomes
Understanding which programme elements work well and why	Progress and process monitoring	PE will help understand activity effectiveness in realising the programme outcomes
Demonstrate impact **pathway** of **PoCRA**	ToC based approach	ToC based approach will help measure attributable impact of ICRG

We propose development of M&E framework that covers a comprehensive **performance evaluation** while also calling for **a concurrent progress monitoring.** While the performance evaluation will help measure how the program has been able to impact the overall program subject, concurrent progress monitoring will measure effectiveness of the program delivery design. Thus, not only commenting on 'what' has worked for the program but also 'how and in what circumstances' has worked, creating a feedback loop from the practitioners to the policy-makers.

To guide the M&E discourse, we have developed an indicative results framework for PoCRA. The indicative results framework for the assignment has been presented below.

2.2 Project Results Framework

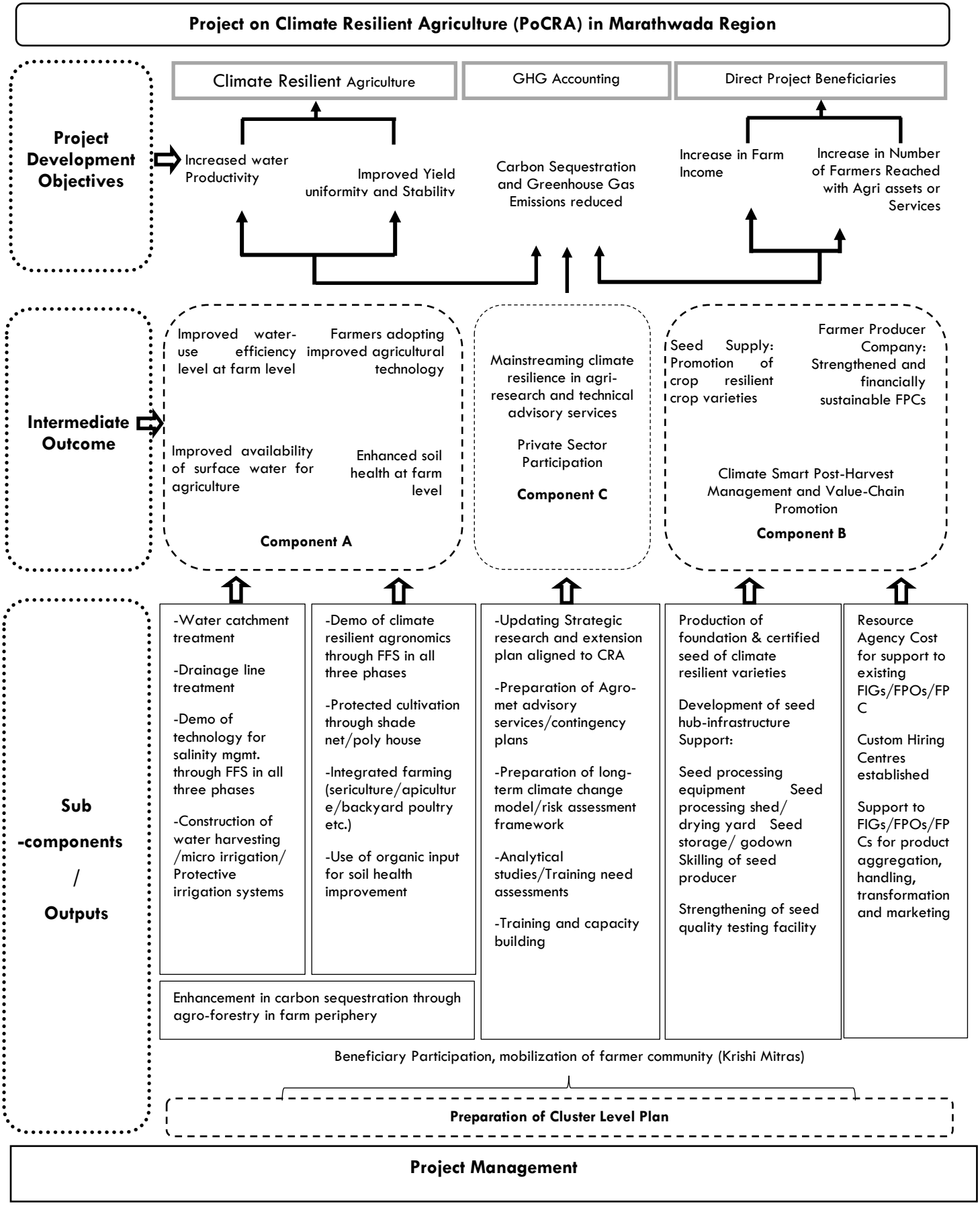


FIGURE 6: PROJECT RESULTS FRAMEWORK

3. Overarching Monitoring Learning and Evaluation Framework

The below schematic presents the overarching framework that is proposed to be adopted for this assignment. The project results framework would guide the Impact evaluation as well as Concurrent Progress Monitoring. Proposed Impact Evaluation Design and Concurrent Progress Monitoring Framework is explained in the subsequent sections. In addition to Monitoring and Evaluation (M&E), we propose to incorporate and embedded aspect of learning (L) to inform the intervention and project design at bi-annual and annual intervals.

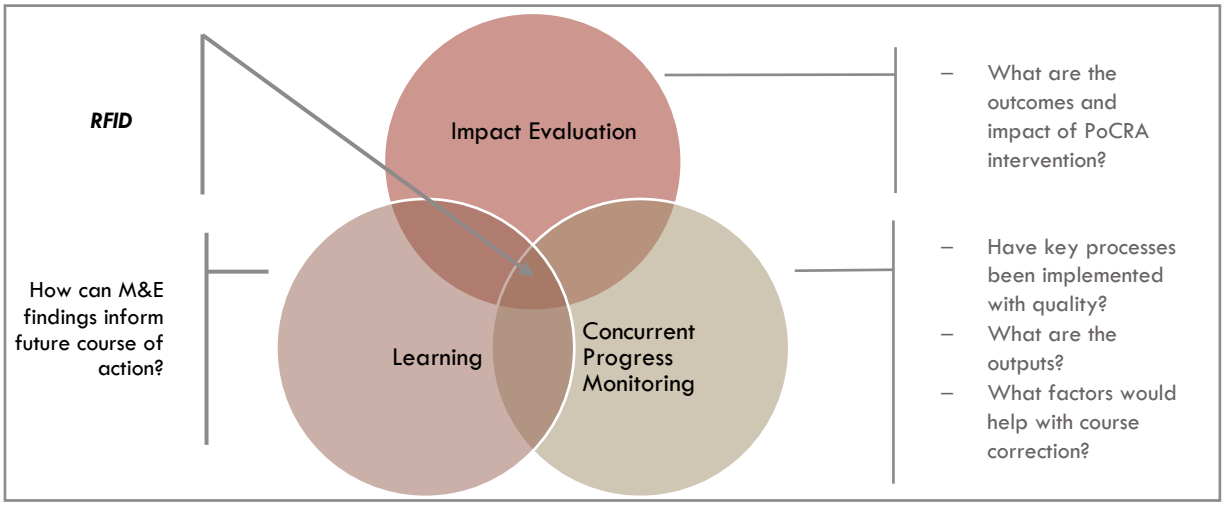


FIGURE 7: MLE FRAMEWORK

3.1 Impact Evaluation Design

The purpose of conducting an impact evaluation is to establish outcome causality and attribute the results to project interventions. Our understanding of the project is that the intervention activities will not be randomly assigned, thus, with this rationale, we propose to adopt a **Quasi-experimental Double Difference Design for Impact Evaluation**[8]. Quasi-experimental designs will assist in identifying a comparison group that is as similar as possible to the project group in terms of baseline (pre-intervention) characteristics. The comparison group will in turn capture what would have been the outcomes if the programme had not been implemented (i.e., the counterfactual)[9]. Subsequent sections describe the various steps entailed in the evaluation with regards to constructing a valid comparison group and detecting change induced by the programme intervention (attribution).

3.1.1 Constructing a Comparison Group: A Priori Matching

We propose to create counterfactual for each of the project cluster and villages. Therefore, the ratio of project to comparison will be 1:1. The first step of matching exercise would be to match the project clusters with the comparison clusters[10]. As discussed in the inception meeting, it is proposed that the matching of project and comparison clusters will be done based on a climate vulnerability index, which had been used in selection of the project clusters. As the PoCRA project is focused on climate resilience, climate change vulnerability index as defined by IPCC-2011 will be suitable for matching and selection of comparison clusters. Villages would be further selected from the matched clusters. Based on the review of village level data of the matched clusters, the sampling strategy for comparison villages would be decided. Matching at village level will also be attempted else they can be randomly selected from the matched comparison clusters.

[8] The International Institute for Environment and Development (IIED) have undertaken evaluation quasi-experiment to demonstrate the effectiveness of climate-resilient agriculture interventions http://pubs.iied.org/pdfs/17403IIED.pdf
[9] UNICEF 2014, Quasi-Experimental Design and Methods, Methodological Briefs https://www.unicef-irc.org/KM/IE/img/downloads/Quasi-Experimental_Design_and_Methods_ENG.pdf
[10] Cluster refers to mini watershed cluster

The list of indicators that have been used to develop the climate vulnerability index have been mentioned in the below table[11]

TABLE 3: INDICATORS IN CLIMATE VULNERABILITY INDEX

Indicator Category	Indicator List
Climate exposure Indicator	• Change in annual rainfall • Change in June rainfall • Change in July rainfall • Change in number of rainy days • Change in maximum Temperature • Change in minimum Temperature • Change in incidence of extremely hot days • Change in incidence of extremely cold days • Change in frequency of occurrence of frost days • Change in drought • Change in incidence of dry spells of >= 14 days Extreme rainfall events • Extreme rainfall events • Change in 99 percentile Rainfall • Change in no. of events with > 100 mm rainfall in 3 days • Change in max rainfall in 3 consecutive days as % to annual normal
Sensitivity	• Ratio of Net sown area to geographical area • Ratio of Degraded land to Geographical area • Drought proneness (Frequency of droughts in last ten years) • Ratio of area operated by small & marginal farmers to total land holding • Ground water Index (based on Ground water prospect)
Adaptive Capacity	• SC / ST population • Head of the household having income < Rs 5000 per month • Ratio of agriculture workers to total population • Gender gap (gap between literacy rates of total population and the female population • Livestock Population (No. of livestock per household) • Agrarian distress

Methodology: A-priori matching exercise involved two steps.

i. **Selection/creation of index for cluster matching:** As the first step the composite index score that will be used for matching of clusters will be identified or created. In this case, the climate vulnerability index score , which has already been created for identification of project intervention clusters will be used for matching and identification of comparison clusters.

ii. **Selection of matched clusters:** The clusters which have the closest climate vulnerability index score to the project clusters will be chosen to be part of the comparison group. If a matched comparison cluster cannot be surveyed for some reason, the matched pair will be replaced by the next least variant cluster.

[11] Project Implementation Plan(PIP), PoCRA

3.1.1 *Attributing Impact Using Difference in Difference Estimator*

Difference-in-differences (DID), also known as the 'double difference' method, compares the changes in outcome over time (pre-post intervention) between treatment and comparison groups (with-without intervention) to estimate impact. DID gives a stronger impact estimate than single difference, which only compares the difference in outcomes between treatment and comparison groups following the intervention. Applying the DID method removes the difference in the outcome between treatment and comparison groups at the baseline. It is thus suggested that evaluation shall try to compute the difference-in- differences (DID) as an estimate to evaluate the effects of interventions and other treatments of interest on outcome variable(s).

In order to assess the difference in difference, study shall create a dummy variable of treatment and post to conceptualize a regression equation as described below:

$$yi = \beta 0 + \beta 1\ treatmenti + \beta 2\ posti + \beta 3\ treatmenti * posti + ei$$

Wherein ***post*** is a dummy variable, which =1 for Endline, and =0 for before; ***Treatment*** is a dummy variable, which =1 if individual is in treatment and =0 if the individual is not. Based on the above regression equation the difference in difference can be computed as β3 as described below:

TABLE 4: DID ESTIMATION

	Project	Comparison	Difference
Before	β0 + β1	β0	**β1**
After	β0 + β1 + β2 + β3	β0 + β2	**β1 + β3**
Difference	**β2 + β3**	**β2**	**β3**

Where:

- ≈ β3 is the DD estimator. It is the differential effect of treatment.
- ≈ β2 represents the time trend in the control group
- ≈ β1 represents the differences between the two at the Baseline

3.1.2 *Sampling Estimation*

We have adhered to the sample distribution provided in the ToR by PoCRA PMU[12]. We understand that the distribution of sample across clusters, villages and households' level have been done to account for a minimum detectable impact (MDI) at the project level.

To conform to the sample proposed and ascertain MDI, we accounted for intra-class correlation and estimated the design effect equalling ρ (m – 1) + 1, where ρ is the intra-class correlation coefficient (ICC) and m is the average number of observations per cluster. The sample thus, provides 80% power to detect the minimum change at a 0.05 level of statistical significance[13]. The sample size estimation has been done using the below mentioned formula:

$$\boldsymbol{MDI = 2.8 * \sqrt{(b(1-b)} * \sqrt{\frac{1}{P(1-P)}\left(\frac{\rho_C(1-R_C^2)}{N} + \frac{(1-\rho_C)(1-R_I^2)}{rN}\right)}}$$

1. b is the baseline prevalence rate of a binary outcome (0.5[14])
2. P is the fraction of the sample in the treatment group (0.5)
3. ρc is the intra class correlation (ICC) i.e. the proportion of variance among catchment areas (0.02)
4. RC^2 and RI^2 are the regression R-squared values at the cluster and individual level respectively (0.3)
5. N is the total number of catchment areas selected
6. r is the total number of respondents in each catchment area

[12] 241 clusters, 2 villages in each cluster and 5 households in each village (ToR
[13] The sample size reflects 95% Confidence and 10% margin of error (ToR, page 84)
[14] Maximum rate of prevalence

The estimated sample size (number of household or respondents) to be covered in each project and comparison area is 2410. The proposed sample size is powered to have an MDI (minimal detectable impact) of 5 %. Table below provides the overall sample for impact evaluation.

TABLE 5: SAMPLE DISTRIBUTION FOR IMPACT EVALUATION

Phase	Cluster		Villages		Households	
	Project	*Comparison*	*Project*	*Comparison*	*Project*	*Comparison*
Baseline	241	241	482	482	2410	2410
Mid Term						
End Term						
Total (each phase)	**482**		**964**		**4820**	

3.1.3 Sampling Strategy

A multistage approach will be adopted for sample distribution.

A. Selection of District

All of the 8 project districts will be covered namely; Aurangabad, Bid, Jalna, Latur, Osmanabad, Nanded, Parbhani and Hingoli.

B. Selection of Clusters

As the next step, out of the 347 project clusters, 241 clusters will be chosen. As discussed in the inception meeting , it is proposed to adopt simple random sampling for selecting the project clusters from the total available project clusters. The comparison clusters, as discussed above would be selected based on the closest climate vulnerability index score, when matched with the sampled project clusters.

As discussed in the inception meeting, simple random sampling would be adopted in all the three round of evaluation survey i.e. the baseline, midline and endline for section of project clusters. In the midline and endline survey too, the comparison clusters which have the closest climate vulnerability index score to the sampled project clusters will be selected.

D. Selection of Villages

In each cluster, two villages will be selected on a random basis. Therefore, a total of 482 villages in each project and comparison clusters would be selected for the evaluation.

E. Selection of Households

In each of the villages, 5 households will be selected based on a quick listing exercise. An adult member of household, either male or female, who is the owner of the land based on the land records or who is a decision maker on agricultural practice/having farming information, would be the primary respondent. We intend to cover project beneficiaries benefitting or targeted to be covered by various project activities. Hence, the eligible households / beneficiaries will be identified based on a quick listing exercise. For baseline, listing exercise would consider small farm holders (farmers having up to 2.0 ha of farmland) as well as those belong to vulnerable categories such as PWDs, Scheduled Tribes and women headed households. A systematic random selection process will be adopted to identify respondents in project and comparison villages. If the village has less than 100 households the entire village would be listed. If the village has more than 100 households, segmentation of villages would be done into hamlets with the help of a social map, of which one hamlet with most representation of respondent required for the study will be selected. 5 household will be selected from the hamlet/village identified. In case a list of all eligible beneficiaries in a village is available, five respondents can be randomly chosen from this list. For mid-term and end-term, engagement of farmer to the project would also be considered along with the listing criteria used in baseline.

The below table presents the district, taluka, mini watershed cluster, village and household wise sample that will be covered in each round of evaluation survey.

TABLE 6:DISTRICT,TALUKA,CLUSTER,VILLAGE AND HOUSEHOLD WISE SAMPLE TO BE COVERED

District	No. of talukas	Total number of mini watershed clusters under PoCRA	Total no. of clusters chosen for the sampling	Total no. of treatment villages chosen for the sampling	Total no of control villages	Total villages to be surveyed	Total households to be surveyed: 5 per village
Aurangabad	9	58	37	74	74	148	740
Beed	11	37	27	54	54	108	540
Jalna	8	54	35	70	70	140	700
Latur	10	42	30	60	60	120	600
Osmanabad	8	58	37	74	74	148	740
Nanded	16	34	26	52	52	104	520
Parbhani	9	39	28	56	56	112	560
Hingoli	5	25	21	42	42	84	420
Marathwada	**76**	**347**	**241**	**482**	**482**	**964**	**4820**

Longitudinal journey mapping of target beneficiaries: *To understand the impact of the project on its target beneficiaries, it is proposed to track a set of farmer households(approximately 100 to 50), identified during the baseline, over the project period. These households will be selected ensuring that they are spread over the project geography. Tracking them over time will help to understand the level of impact the project activities over the period of project implementation. This journey mapping will also help to identify the activities which have contributed significantly in increasing the climate resilience and income of the farmers.*

F. Field Observation

Field observation will form an important aspect of evaluation. Key experts in the evaluation team would be visiting study sites for field verification of selected project activities particularly relating to agro technology, value chain and supply chain, community water harvesting structures developed as part of the project etc. We propose to cover at least 10% of the proposed project clusters to conduct field verification during each of the evaluation phases. The methodology for selection of project clusters and the key activities to be observed will be decided in consultation with PMU.

G. Qualitative Enquiry

Along with the quantitative survey component and adhering to the theory-based approach to evaluation, we propose to build a strong aspect of qualitative enquiry to inform impact evaluation. The primary objective of qualitative enquiry would be to address the following suggestive research questions:

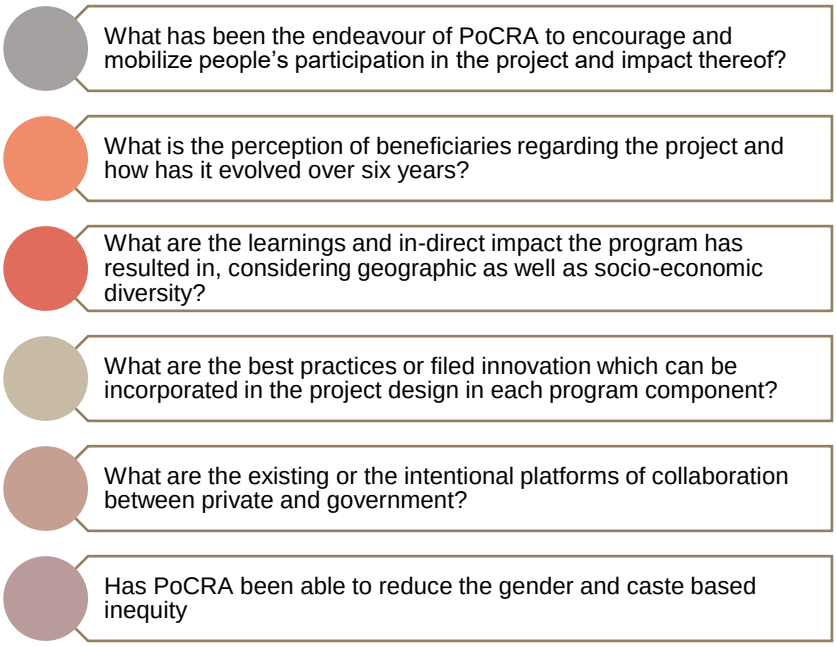


FIGURE 8:KEY RESEARCH QUESTIONS QUALITATIVE ENQUIRY

3.1.3.1 Methodological Components

Following methodological components will be adopted to address the research questions mentioned above.

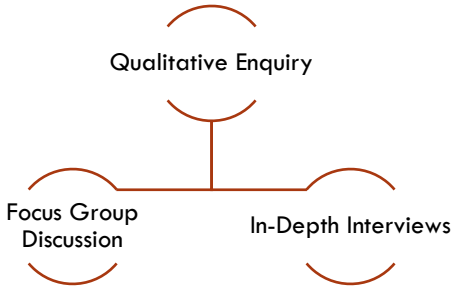


FIGURE 9:QUALITATIVE METHODOLOGICAL COMPONENTS

A. Focus Group Discussion

In addition to the quantitative survey, we propose to conduct Focus Group Discussions (FGDs) in both project and comparison area. The FGDs would be conducted with intended project beneficiaries (i.e. farmers with less than 2 ha of land). During the baseline, the focus of discussion would be to understand the key agriculture related challenges faced by them their perception around climate resilient agriculture and the existing state of farming communities. In addition, during mid-term and end term, FGDs would focus on assessing perception of beneficiaries about the project , current bottlenecks and assess results thereof.

We propose to conduct 3 FGDs per district (2 in project and 1 in comparison areas). Therefore, a total of 24 FGDs would be conducted in each phase.

B. Key Informant Interviews (KIIs)

Promotion of institutional development, service delivery and knowledge for climate-resilient agriculture is also a key outcome component of the project. To assess and understand the subject, we propose to conduct key-informant interviews with PD ATMA, representatives of Climate Innovation centres and other relevant private sector participants working closely or in line with the project agenda. PD ATMA from each district would be interviewed. The number of KIIs with stakeholders will be decided upon consultation with PMU.

As one of the project objective is to strengthen FPCs, FFS and VCRMCs, it is very important to understand their perception and get their feedback on the project implementation activities. Therefore, it is proposed to conduct three FPC representative /FFS facilitator interviews and three VCRMC representative interviews(two in project

and one in comparison area. VCRMC interviews will be conducted in comparison areas in case any organization similar to VCRMC is available in the comparison areas) in all eight districts. During the mid-line and end line, these IDIs will also aim to assess the effect of the project activities on their capacity building and their sustainability. The methodology for selection of FPCs/FFS facilitator and VCRMCs will be decided in consultation with PMU.

3.1.4 Overview of the Total Sample for Impact Evaluation

The sample distribution presented below would remain the same across phases all the three rounds of survey for the evaluation i.e. baseline, mid-term and end term.

TABLE 7: OVERVIEW OF THE TOTAL SAMPLE FOR IMPACT EVALUATION

Sampling Units	Total Sample	
	Project	Comparison
Quantitative Survey		
Total Districts	8	8
Total Clusters	241	241
Total Villages	482	482
Total Households	2410	2410
Focus Group Discussion (FGD)		
Total FGD with famer with less than 2ha farmland	16	8
Field Observation		
Field Observations	~25	-
Key Informant Interviews		
FPC/FFS interviews	16	8
VCRMC representative interviews	16	8 (to be conducted of organization similar to VCRMC is available in control areas)
PD ATMA	8	
Representatives of Climate Innovation centres, other private sector participants	~2-3	

3.1.5 ToC and methodology for measuring the PoCRA Results Framework indicators

Based on the project activities, its intended results and by referring to the PoCRA Results Framework Indicators, a Theory of change for the project has been prepared. The ToC for the project will be finalized based on the feedback and in consultation with the PoCRA PMU team. The draft ToC for the project has been presented in the below schematic. It is proposed that feedback of the PMU team will be sought on the same and Sambodhi will facilitate a discussion with PMU to finalize this ToC .

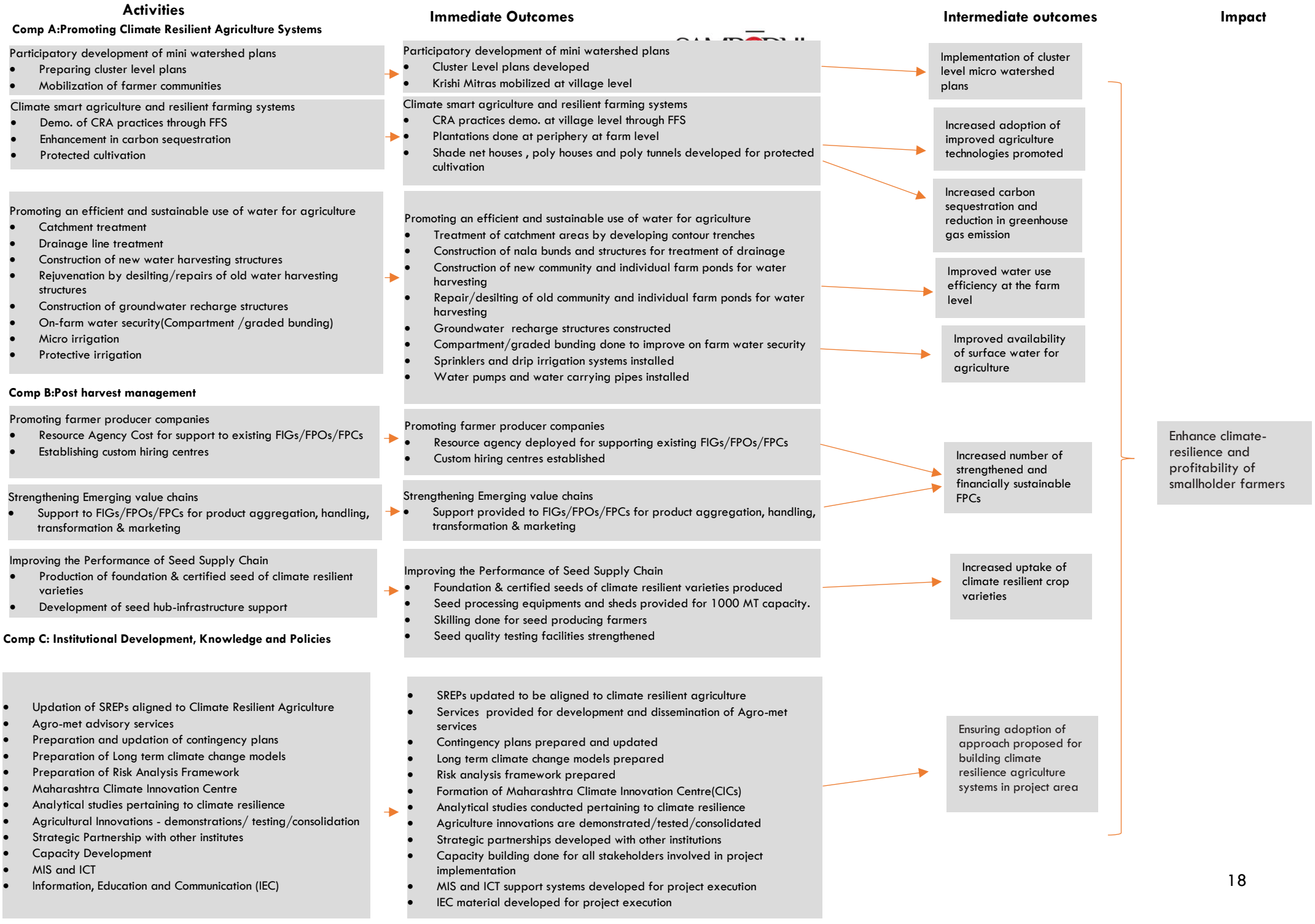


FIGURE 10:DRAFT TOC

Assumptions:

- Cluster level plans developed will be implemented at village level
- Framers will be able to arrange finance initially to implement their corresponding individual level activity
- Farmers will be interested to uptake CRA practices promoted through FFS
- FIGs/FPOs/FPCs will adopt the practices which promoted to them through resource agencies and other capacity building channels
- Farmers will be interested to adopt climate resilient seed varieties
- FPOs, SMEs will adopt the innovative climate resilient practices promoted through CIC

Assumptions:

- Adoption of water efficient practices will lead to less consumption of water for farm production
- Uptake of climate resilient crop varieties will lead to increase in crop production and increase in income
- Improved availability of water will lead to increase in crop productivity
- Strengthened FPCs will lead to higher outreach of agri asset services to the target farmers

The below mentioned points define the context or the situation, responding to which the PoCRA project has been formulated

- Increase in average temperature
- Increase in average monsoon rainfall but high rainfall variability across space and time
- Higher rainfall intensity
- Delays in onset of monsoon rainfall
- More frequent extreme precipitation events and floods
- Prolonged dry spells within monsoon period

The linkage between activities, outputs, outcomes and impact has also been mentioned in a tabular form in the below table. This would also be revised based on feedback of the PMU team if any.

Activity	Output/Intermediate Outcome	Outcome	Impact
Component A: Promoting Climate-resilient Agricultural Systems			Enhance climate resilience and profitability of smallholder farmers
Participatory development of mini watershed plans			
Preparing cluster level plans	Cluster Level plans developed	Implementation of cluster level micro watershed plans	
Mobilization of farmer communities	Krishi Mitras mobilized at village level		
Climate smart agriculture and resilient farming systems			
Demo. of CRA practices through FFS	CRA practices demo. at village level through FFS	Increased adoption of improved agriculture technologies promoted	
Enhancement in carbon sequestration	Plantations done at periphery at farm level	Increased carbon sequestration and reduction in greenhouse gas emission	
Protected cultivation	Shade net houses , poly houses and poly tunnels developed for protected cultivation	Improved water use efficiency at the farm level	
Promoting an efficient and sustainable use of water for agriculture			
Catchment treatment	Treatment of catchment areas by developing contour trenches	Improved availability of surface water for agriculture	
Drainage line treatment	Construction of nala bunds and structures for treatment of drainage		
Construction of new water harvesting structures	Construction of new community and individual farm ponds for water harvesting		
Rejuvenation by desilting/repairs of old water harvesting structures	Repair/desilting of old community and individual farm ponds for water harvesting		
Construction of groundwater recharge structures	Groundwater recharge structures constructed		
On-farm water security(Compartment /graded bunding)	Compartment/graded bunding done to improve on farm water security	Improved water use efficiency at farm level	
Micro irrigation	Sprinklers and drip irrigation systems installed		

Protective irrigation	Water pumps and water carrying pipes installed		
Component B: Climate Smart Post Harvest Management and Value Chain Promotion			
Promoting farmer producer companies			
Resource Agency Cost for support to existing FIGs/FPOs/FPCs	Resource agency deployed for supporting existing FIGs/FPOs/FPCs	Increased number of strengthened and financially sustainable FPCs	
Establishing custom hiring centres	Custom hiring centres established		
Strengthening Emerging value chains			
Support to FIGs/FPOs/FPCs for product aggregation, handling, transformation & marketing	Support provided to FIGs/FPOs/FPCs for product aggregation, handling, transformation & marketing	Increased number of strengthened and financially sustainable FPCs	
Improving the Performance of Seed Supply Chain			
Production of foundation & certified seed of climate resilient varieties	Foundation & certified seeds of climate resilient varieties produced	Increased uptake of climate resilient seed varieties	
	Skilling done for seed producing farmers		
Development of seed hub-infrastructure support	Seed processing equipments and sheds provided for 1000 MT capacity		
	Seed quality testing facilities strengthened		
Component C: Institutional Development, Knowledge and Policies for A Climate-Resilient Agriculture			
Updation of SREPs aligned to Climate Resilient Agriculture	SREPs updated to be aligned to climate resilient agriculture	Ensuring adoption of approach proposed for building climate resilience agriculture systems in project area	
Agro-met advisory services	Services provided for development and dissemination of Agro-met services		
Preparation and updation of contingency plans	Contingency plans prepared and updated		
Preparation of Long term climate change models	Long term climate change models prepared		
Preparation of Risk Analysis Framework	Risk analysis framework prepared		

Maharashtra Climate Innovation Centre	Formation of Maharashtra Climate Innovation Centre(CICs)		
Analytical studies pertaining to climate resilience	Analytical studies conducted pertaining to climate resilience		
Agricultural Innovations - demonstrations/ testing/consolidation	Agriculture innovations are demonstrated/tested/consolidated		
Strategic Partnership with other institutes	Strategic partnerships developed with other institutions		
Capacity Development	Capacity building done for all stakeholders involved in project implementation		
MIS and ICT	MIS and ICT support systems developed for project execution		
Information, Education and Communication (IEC)	IEC material developed for project execution		

The methodology to measure the PoCRA results framework indicators has been presented in the below table. This methodology will be reviewed and further revised based on the availability and feasibility of data

TABLE 8:MEASUREMENT METHODOLOGY FOR POCRA RF INDICATORS

LEVEL	INDICATOR	MEASUREMENT METHOD
	PDO Level	
	Climate resilient agriculture: Increased water productivity *(Water productivity in kg.m-3: ag. production / water consumption (change relative to baseline: %))*	The indicator is defined as agricultural production per unit of evapotranspiration-a proxy for consumptive water use. Water productivity would be calculated for the Kharif season only with production estimated for main crops cotton, soybean, pigeon pea, green gram, and black gram. Given that the total production estimate is to be arrived at for a large geographical area, secondary statistics on area under production would be sourced from relevant state department, collected using crop cutting method. Primary data on yield would be sourced from the household survey. For rainfed cropping systems, consumptive water use (Et) is expressed as growing season rainfall and soil water changes. In dryland systems, changes in soil water at the beginning and end of growing season may be assumed to be insignificant, so that water consumption is simply estimated as rainfall during the growing season[15]. Precipitation data for the growing season would be sourced from the state department. Assessment would be done at baseline, and annually from Year 3 onwards.
	Climate resilient agriculture: Improved yield uniformity and stability *Spatial and temporal yield variability for oilseeds (soybean) and pulses (pigeon pea) (coefficient of variation CV crop yield)*	Measurement requires calculation of coefficient of variance for the said crops using the production data. We would be collecting production statistics of the crops of interests during the household survey. Key variables would include- area sown, production, sale and costs incurred. We would be using this data to compute yield. Using the yield data from the survey we would be calculating the coefficient of variation (CV= standard deviation S/mean $\bar{X}$). Spatial variability would be estimated at midline and endline data while temporal variability would be estimated at endline only.

[15] Cook, Simon; Gichuki, Francis; Turral, Hugh. (2006). Agricultural water productivity: estimation at plot, farm and basin scale. Colombo, Sri Lanka: International Water Management Institute (IWMI). Challenge Program Secretariat. 16p. (Challenge Program on Water and Food, Basin Focal Project Working Paper 2)

LEVEL	INDICATOR	MEASUREMENT METHOD
	GHG Accounting: Carbon sequestration and Greenhouse Gas emissions reduced *Net GHG emissions (in '000 tCO2eq/year)*	• The boundary condition for GHG account will be same as in the baseline condition • Soil data of the project area will be collected from the PMU at the end of each year. • Crop type, crop production related data will be collected from household survey and PMU to account carbon fixation in the system • Annual plantation area data will be collected from the PMU this will include type of plantation in agroforestry and land use change. • Data related to machineries use and electricity or fuel use during the cultivation period will be collected from PMU as well as during the household survey. • Fertilizer (N. P, K) application and manure application data will be collected during the field survey and verified with the PMU. • Data related to construction activities in the project area like farm pond, nala bund etc. will be collected from the PMU at each year. GHG Assessment of the project will be done at mid-term and end of the project
	Annual farm income *Farm income comparator (total; male & fem. landholders) (ratio of farm income for women-headed HH with/without PoCRA)*	Agricultural production and sale statistics would be collected during the household survey. We would be calculating the gross production value as well as the net farm income from the same. The data would be disaggregated with respect to the groups of interests i.e. male, female and landholders-the variables being included in the demographic section of the household survey. This indicator will be tracked at baseline, midline and endline.
	Direct project beneficiaries *Number of farmers reached with agricultural assets or services (% of female)*	The data of number of direct beneficiaries of the project will be collected from the project MIS and associated applications and relevant project personnel. 1. The data on individual grant beneficiaries will be taken from DBT portal 2. The data of beneficiaries of FFS will be taken from FFS application 3. The data of direct beneficiaries of FPOs will be taken from PS Agribusiness of corresponding districts 4. The data of people who have availed trainings under the program will be taken from PMU Any other direct beneficiary of the program will also be identified with the support of the PMU team
INTERMEDIATE OUTCOME INDICATORS		

LEVEL	INDICATOR	MEASUREMENT METHOD
Component A: Promoting Climate-resilient Agricultural Systems	Climate resilient agriculture: Farmers adopting improved agricultural technology *Farmers adopting improved agricultural technology promoted (% of female)*	This indicator will be tracked from the HH survey during the evaluation and concurrent monitoring rounds of survey. The surveyed beneficiaries will be enquired to identity if they are adopting any of the improved agriculture technology practices. This indicator will be tracked annually.
	Climate resilient agriculture: Improved water-use efficiency at farm level *Area provided with new/improved irrigation or drainage services (in ha)*	The data of individual level drainage services will be taken from DBT portal report. The data of community level new/improved irrigation services will be provided by Project Specialists of the project districts. Total area under Irrigation Projects= IP (Irrigation Project)$_1$*Area under irrigation project+ IP (Irrigation Project)$_2$*Area under irrigation project….+ IP(Irrigation Project)$_n$*Area under irrigation project This indicator will be assessed annually.
	Climate resilient agriculture: Improved availability of surface water for agriculture *Surface water storage capacity from new farm and community ponds (in 1,000 m3)*	The data of individual level farm ponds will be taken from DBT portal report. The data of community farm ponds will be provided by Project Specialists of the project districts. Total Water storage capacities of new Farm Ponds = FP (Farm Pond) $_1$*Storage capacity of FP+ FP $_2$*Storage capacity of FP+……+ FP $_n$*Storage capacity of FP Total Water storage capacities of new Community Ponds = CP (Community Pond) $_1$*Storage capacity of CP+ CP $_2$*Storage capacity of CP+……+ CP $_n$*Storage capacity of CP This indicator will be assessed annually.
	Climate resilient agriculture: Enhanced soil health at farm level *Area with GAPs for improved management of saline and sodic soils (in ha)*	Not applicable as these areas are outside Marathwada region
Component B: Climate-smart Post-harvest Management and Value-chain Promotion	Seeds supply: Promotion of climate resilient crop varieties *Oilseeds (soybean), Pulses (pigeon, chick pea) production area under cultivation w/ certified seeds of improved varieties (share in %)*	The percentage area under cultivation for oilseeds (soybean) and pulses (pigeon, chick pea) *using certified seeds of improved varieties will be accessed through the beneficiary survey conducted as part of evaluation surveys and annual round of concurrent monitoring*. This indicator will be assessed annually.
	Farmer Producer Companies: Strengthened and financially sustainable FPCs *Number of project-supported FPCs with growth in annual profits*	As a statutory requirement, all the FPCs have to submit their audited financial statements to the Registrar of Companies. Taking the list from POCRA MIS, we would be soliciting annual audit statements/financial statements of all the project supported FPCs. Analyzing the Profit and Loss accounts, the indicator would be calculated annually .

LEVEL	INDICATOR	MEASUREMENT METHOD
Component C: Institutional Development, Service Delivery and Knowledge for Climate-resilient Agriculture	Research and Extension: Mainstreaming climate-resilience in agricultural research and technical advisory services *Number of updated district SREPs with internalized climate resilience agenda (x out of 15)*	Revised and validated SREPs are sent by PD ATMA to PMU where the information is recorded by the M&E Specialist. This indicator is reported as an absolute number (cumulative) for year 2 and year 3 of project implementation. This indicator will be assessed annually from Year 2 onwards.
	Climate Innovation Center: *Number of clients (FPOs, SMEs, ...) receiving services from the CIC Private sector participation*	The information is sourced from the annual reports prepared by the CICs and submitted to the PMU where it is recorded by the M&E. This indicator is reported as an absolute number (cumulative) from year 4 onwards
Cross-cutting Indicators	Beneficiary Participation and Civic Engagement *Number of approved participatory mini watershed plans implemented / under implementation*	This indicator will be reported as an absolute number of participatory mini watershed plans approved by Gram sabha. The information is collected by the microplanning agencies from the offices of the SDAOs. The microplanning agencies submit the validated mini-watershed plans to the PMU where the data is recorded by the M&E specialist. This indicator will be monitored on a semi-annual basis (cumulative). Further, we would be adding questions related to participation and civic engagement in the household schedule to ascertain level of engagement at the household level.

3.1.6 Environment and Social Management Framework (ESMF) Audit

The objective of the Environmental and Social Management Framework (ESMF) Audit is to audit and understand that the measures that should be taken to mitigate the adverse environmental and social impacts are considered while implementing the Project. It is to use a holistic view of risk mitigation assisting in achieving the overall goals and objectives of the project. Since the project aims to build the resilience of smallholder farming systems, it is envisaged that the environmental and social impacts are likely to be minimal and therefore has been classified as category B project (partial assessment) under the World Bank environmental classification of projects.

3.1.6.1 Methodology

PoCRA along with World Bank has developed an ESMF that includes an environmental management framework (EMF), social assessment and social management framework (SMF) and a tribal peoples' planning framework (TPPF). The purpose is to ensure that execution of the PoCRA considers potential environmental and social impacts that are likely to construe with the implementation of the various activities proposed. A baseline has been developed with regard to the above.

ESMF audit during Mid Term and End Term would refer to the baseline extensively. Further information/ primary data requirement needed will be suggested for collection at the field level, if required, in addition to the data/ information already available through the baseline reports. Cluster wise information of key indicators will be required as identified in the ToR for collating information on ESMF. The primary beneficiaries of the project will be selected for the audits in the selected clusters.

The proposed ESMF PoCRA framework includes the following steps to be considered at the cluster level based on the time steps defined;

1. Review of the Baseline documents for ESMF that have been prepared. Providing suggestions for modifications if any for collation of cluster level disaggregated data and information
2. Review and revisit of the environmental and social impacts based on the various components identified for implementation in the PoCRA and contextualising to the unit of analysis
3. Development of criteria for screening of interventions and categorisation as high, mid and low risk for all clusters selected
4. Identification of mitigation measures for adverse impacts at the cluster level
5. Checking the compliance of the ESMF with applicable legislation, policies and regulation of the government at the central and state level
6. Identify roles and responsibilities including reporting procedures
7. Highlighting need for technical assistance if any and
8. Outlining capacity needs

3.1.6.2 Data Collation and Analysis

The data in the document is right now organised either at the state level or by sub-divisions or at the district scale. Cluster level information is aimed to be collected to add further to the information collected. Review of the baseline will provide scope for adding to the current impacts, mitigation measures proposed and indicators to be monitored. A suggested format for primary data collection by the project components will be developed and used. Beneficiaries both individual and VCRMC members will be targeted for collecting the information based on the nature of interventions outlined.

Impacts will be studied based on socially disaggregated data collected by gender, caste, class, religion any ethnic groups to capture the variation in the population in the clusters defined. Gender differentiated information would be collected where applicable. As also realised in the baseline documents, the distinctiveness in the society presents a challenge in addressing the concerns of all the groups in project implementation. However, an attempt will be made by clusters to categorise the major groups that need to be formed. This may vary from one cluster to other and need not be homogenous. The SMF developed for the state highlights the distinct groups that may need to be considered in the assessments to be undertaken. A consultative process will be followed in the collation of information targeting various stakeholders including government entities and communities in the project region. Any external influence on the project will also be mapped including developments in national, international policy frameworks etc. The EMF will be an integral part of the M&E framework for capturing outcome and process-based indicators of progress.

3.1.6.3 Key Outputs

Details of project and non-project outputs and outcomes are summarised which will form the base for the audit. Proposed measures will be assessed at the unit at which analysis is undertaken. The table below is a proposed format for presenting the outputs that will get generated as a result of the analysis of the data at the cluster levels.

TABLE 9: ESMF OUTPUT MATRIX

PoCRA Components	Technology/ Practice	Environmental Impacts	Social Impacts	Mitigative measures	Indicators
	Comp. A Promoting CRAS				
A1. Participatory Development of Mini Watershed Plans		-	-	-	-
A2. On-farm climate resilient technologies and agronomic practices	Technologies used For instance Zero till Agronomic practices followed and implications	Positive and negative implications if any	Suggestive Variables: 1. Social inequities – caste, class, gender 2. Conflicts – land and other resource access issues 3. Health impacts 4. Delays 5. Compensatory issues 6. Transparency and Accountability	-	-
C3. Knowledge and Policies		-	-	-	-

Deliverables: Mid-term and End Term ESMF Audit Report

3.1.7 GHG Accounting Methodology

GHG emission assessment for the project will be carried out at the End line (after final year of intervention) of the project. However, a mid-term GHG assessment will also be done along with the end line assessment . As understood during the interactions during the inception meeting, baseline GHG assessment has already been done. The boundary conditions that were used to define the baseline GHG emissions values will be assessed based on which the end term GHG assessment will be done.

3.1.7.1 Methodology

Defining the boundary is crucial for assessing the GHG emission from the agriculture practices, as it determines the activities, which will be included in the study. To facilitate convenient accounting, the following tiers have been suggested (WRI/WBCSD 2004; Carbon Trust 2007; BSI 2008):

Scope1: direct, i.e., onsite emissions
Scope2: emissions embodied in purchased energy
Scope3: all indirect emissions not covered under tier2, such as those associated with the transport of purchased and sold goods, business travels, waste disposal, etc.

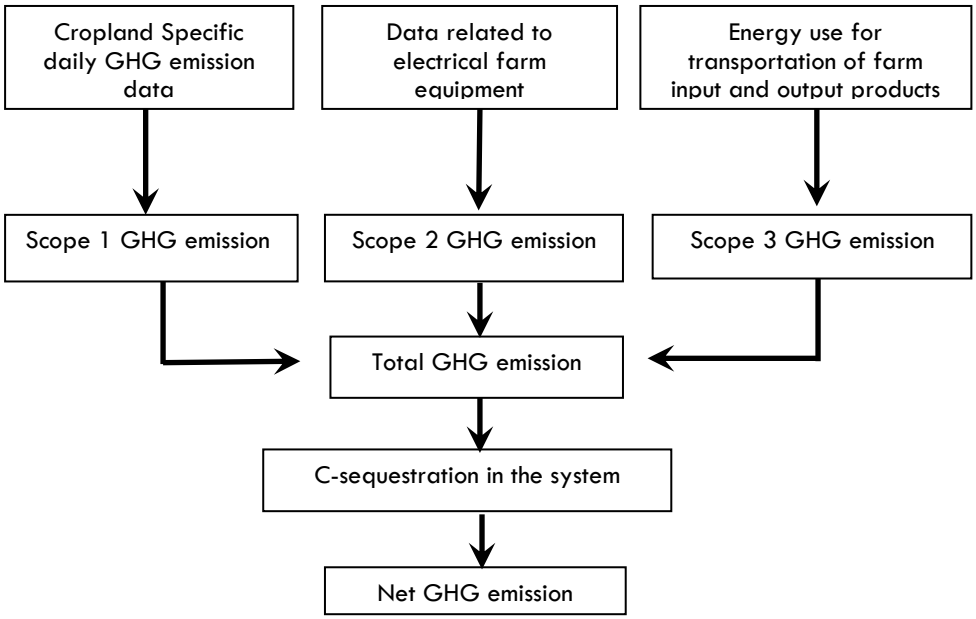
Ex-ACT model of FAO will be used to assess the GHG emission at the end term of the project. However, the same model will be used with the specified boundary conditions during the mid-term stage also to assess the progress in the GHG emission.

It is important to discuss the boundary conditions with PMU that were assumed for the already available baseline estimates of GHG emission.

The PMU will provide the data related to the land use change in the project area due to implementation of project activities like Horticulture plantation, agroforestry in the community land or individual land etc.

During the mid team and end term evaluation survey, relevant questions will be included to account the fertilizer application to the field for different crops, production of different crops and construction of farm pond, nala band etc to address the GHG emission from these activities in the Ex-ACT tool.

FIGURE 11: DIAGRAM OF GHG EMISSION ESTIMATION



The data related to change in soil organic carbon at the farmer fields after the implementation of the project will be taken from the PMU. Crop yield data be collected from the household survey and also from the PMU. The data related to annual irrigation activities in the project area will also be collected from the PMU.

Deliverable: End term GHG Assessment as part of the impact evaluation report

3.1.8 Overview of Evaluation Methodologies

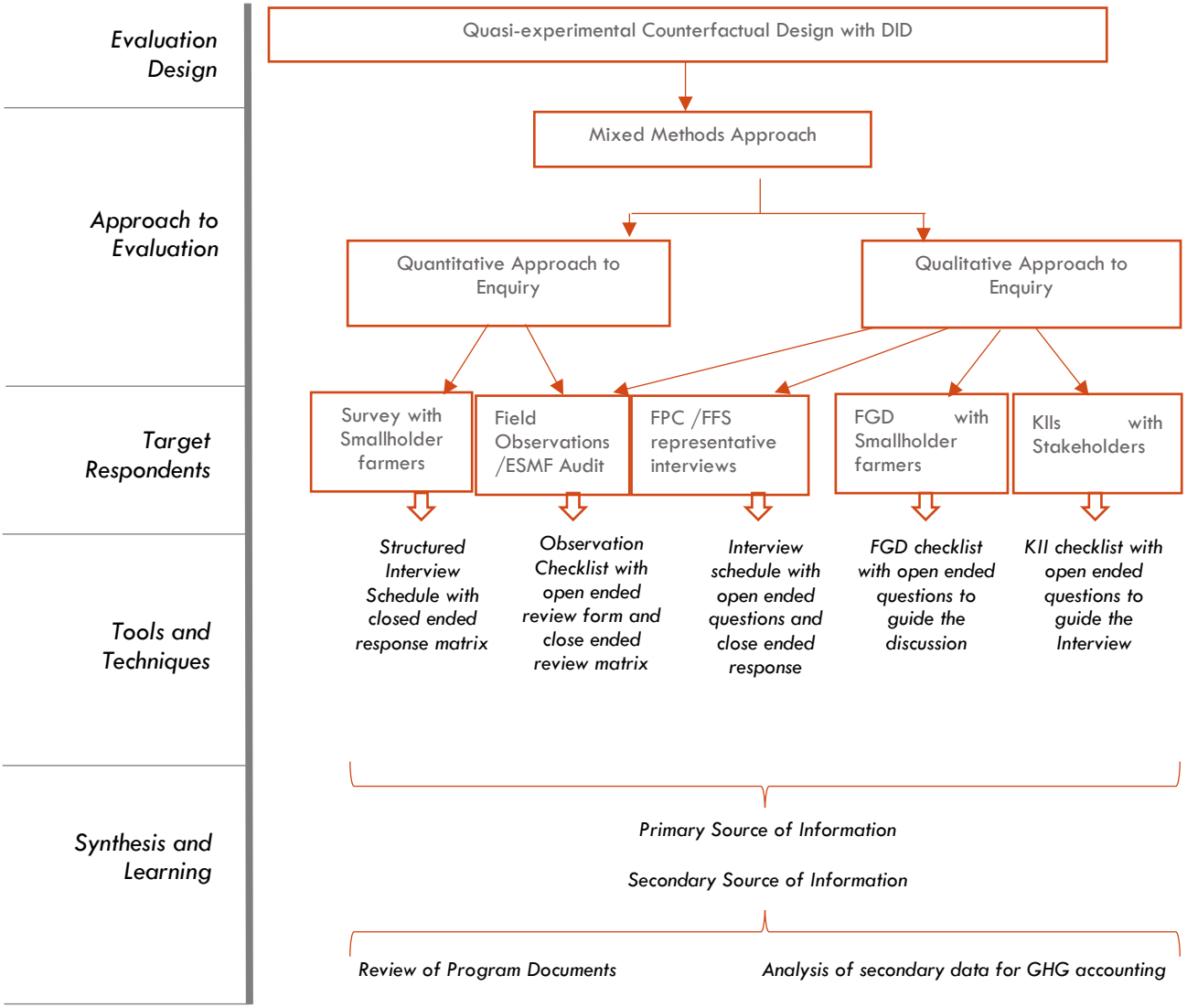


FIGURE 12:EVALUATION METHODOLOGY OVERVIEW

3.1.9 Key Deliverables for Impact Evaluation

Following will be the key deliverables for impact evaluation:

TABLE 10:KEY DELIVERABLES IMPACT EVALUATION

Deliverable	Baseline	Mid Term	End Term
Inception Report	✓ (During the start of the project)		
Evaluation Report with Relevant Data Set	✓	✓	✓
ESMF Audit Report		✓	✓

3.2 Concurrent Progress Monitoring

The second component of the assignment is to conduct a concurrent progress monitoring. The rationale behind this would be to ascertain which are the key components of an intervention that are effective, for whom the intervention is effective and under what conditions the intervention is effective. Furthermore, progress monitoring can help us understand why certain results were achieved- be it positive, modest or insignificant.

3.2.1 Monitoring Framework

To document the extent to which an intervention is delivered as intended, we propose to explore two aspects of concurrent monitoring as given in the figure below;

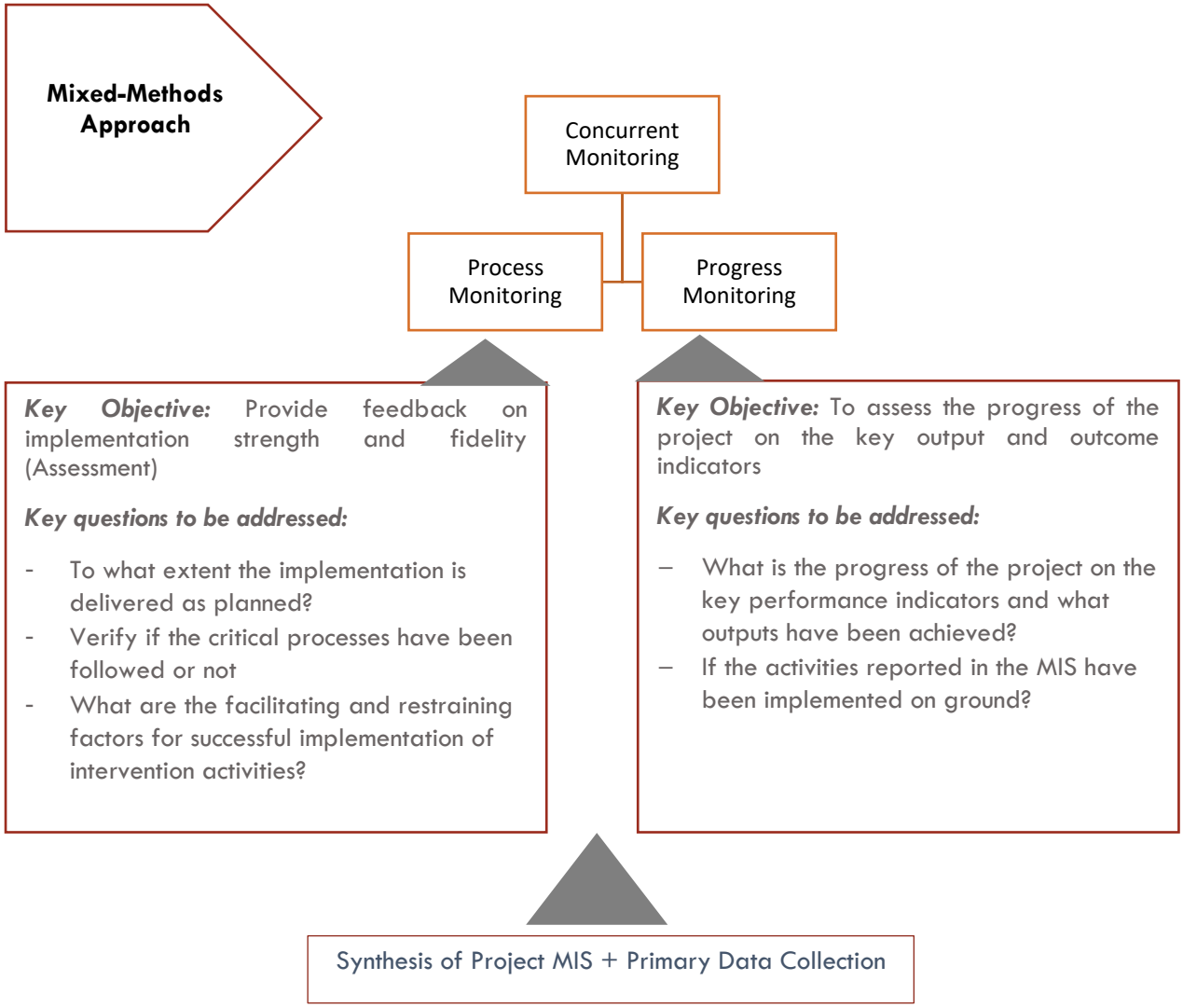


FIGURE 13: CONCURRENT MONITORING FRAMEWORK

3.2.2 Methodological Approach

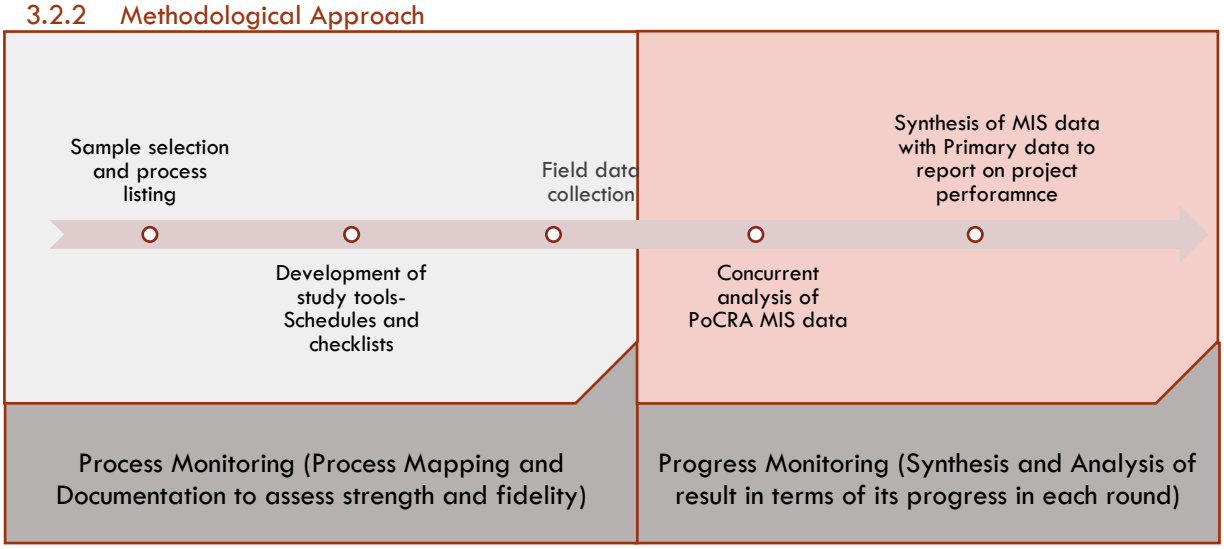


FIGURE 14:APPROACH FOR CONCURRENT MONITORING

Following would be the key steps in forming the methodology for concurrent monitoring.

A. Sample selection and process listing

ToR provides the project development objectives along with the list of activities planned to be conducted within the project areas. However, given the phased approach to implementation, it is expected that the activities will be carried out in phases, across districts and clusters. Therefore, it is proposed that as a first step the sampled for concurrent monitoring will be selected (in line with the methodology proposed in section 4). Subsequently the processes that are being implemented and would need to be monitored will be listed. Discussion with PMU team and secondary literature review of relevant documents will also be done to understand these key processes.

It will also be attempted to understand the similar activities in comparison areas. During the process listing, we intend to interact with PMU and other relevant stakeholders to list and understand the ongoing schemes or projects of similar nature so that a premise for assessment could be built.

B. Development of study tools- Schedules and Checklists

Once the processes are mapped, process checklist, observation schedules and interviews schedules will be developed.

TABLE 11:TOOLS FOR CONCURRENT MONITORING

Structured Interview Schedule	Interview schedule will be developed for respondent survey and will include questions relating to the access to intervention, processes, respondent's participation, perception and feedback on activities. These interviews will also aim to assess the fidelity of the activities implemented as per the project MIS. As part of the beneficiary survey physical observation of the in progress and completed activities will be done
Key-informant Interview Schedule	The project activities will be carried out at various levels, including individuals , community (village or cluster) as well as district level. Key informant interviews will be conducted with key stakeholders involved in implementation of the project to get their feedback on project implementation and further improvement of the program
Focus Group discussion schedule	Focus group discussions will be done with VCRMC members and Project specialists of particular districts to investigate the current status of implementation of the project and get feedback on project implementation and further improvement of the program.

As part of the concurrent monitoring, the access and convergence with various existing government programmes will also be accessed. Feedback on the capacity building initiatives will also be taken from the relevant project stakeholders.

C. Concurrent Analysis of PoCRA MIS Data

For monitoring the progress of the project, the MIS data which reports on the progress of activities and outputs will be analysed to see if the project implementation is going on as per its planned pace. The project performance would be assessed on the key performance indicators including the results framework indicators which need to be assessed on a semi-annual or annual basis. For this, queries or the relevant indicators on which data is required will be identified and the PMU MIS team and other relevant stakeholders will be contacted to obtain this data. Analysis of the MIS data will be done to compare the project outputs with their targets(if any). This will help in identifying the laggards in the implementation and the reasons for the same can be probed through interaction with the concerned project team. Component and geography wise analysis will be done to identify the leaders and laggards in the project implementation.

D. Synthesis of MIS data with Primary data to report on project performance

As a last step, the MIS data on the project progress and the primary data on the quality of implementation (from process checklists and beneficiary interviews) will be synthesized to report on the status of implementation of the project at that point of time. The concurrent monitoring reports will highlight the activities/processes for which the implementation quality needs to be improved. It would also aim to identify the challenges or bottlenecks in implementation. The overall objective of the bi-annual concurrent monitoring reports will be to provide feedback to the PMU on the status of project implementation and provide recommendations for course correction.

3.2.3 Sampling Strategy

The sampling size and methodology that will be adopted for concurrent monitoring has been explained in this section .

In line with the ToR and the proposed methodology, concurrent monitoring will be conducted in both project and comparison areas. The ratio for project to comparison will remain at 2:1 (as given in the ToR).

The concurrent monitoring exercise intends to cover all 347 clusters across 8 districts over the period of 6 years. 12 concurrent monitoring rounds would be conducted over 6 years i.e. two in a year. Given the phased approach to implementation, the implementation will be ongoing in 70 clusters in year I, 175 in year II and 102 in year III. Sampling strategy for concurrent monitoring is proposed likewise and as presented in the ToR. Number of clusters to be visited in each district in each round will be selected proportionately. The distribution of the beneficiary sample across districts and monitoring rounds is presented in the table below

TABLE 12: CONCURRENT MONITORING SAMPLE DISTRIBUTION

Sl. No	Districts	Round wise clusters to be covered												Total
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Aurangabad	3	5	5	5	5	5	5	5	5	5	5	5	58
2	Bid	3	4	3	3	3	3	3	3	3	3	3	3	37
3	Jalna	2	2	5	5	5	5	5	5	5	5	5	5	54
4	Latur	3	3	4	4	4	4	4	4	3	3	3	3	42
5	Osmanabad	3	5	5	5	5	5	5	5	5	5	5	5	58
6	Nanded	2	2	3	3	3	3	3	3	3	3	3	3	34
7	Parbhani	2	3	3	3	3	3	3	3	4	4	4	4	39
8	Hingoli	2	3	2	2	2	2	2	2	2	2	2	2	25
Total Project clusters		**20**	**27**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**347**
Total Comparison clusters		**10**	**14**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**174**
Total Project sample		300	405	450	450	450	450	450	450	450	450	450	450	5205
Total comparison sample		150	210	225	225	225	225	225	225	225	225	225	225	2610
Total beneficiary sample per round		**450**	**615**	**675**	**675**	**675**	**675**	**675**	**675**	**675**	**675**	**675**	**675**	**7815**

3.2.3.1 Selection of comparison cluster and villages

Similar to impact evaluation, comparison clusters will be selected based on *a priori matching* based on the climate vulnerability index. Further, one village would be selected randomly from each sampled cluster.

3.2.3.2 Selection of Respondents

The ToR suggest that beneficiaries should be selected based on the project components and sub-components to be monitored. In line with the ToR, a total of five direct beneficiaries will be surveyed for individual based interventions(e.g. individual farm ponds, drip irrigation, plantation , poly house, share net etc). Also, for community based interventions(e.g. check dams, community farm ponds), representatives of VCRMC and ten residents of the village will be surveyed. The sample for interviews and verification will be derived from the total list of beneficiaries in village as per the PoCRA MIS data. The table below provides the indicative list of components and activities which will be monitored, the target respondents and sample that will be covered for the same. Finalization of the components to be monitored and key areas of enquiry will be finalized in consultation with PMU.

TABLE 13: TARGET RESPONDENTS FOR CONCURRENT MONITORING AND SAMPLE

Intervention Type	Target Respondent	Sample	Enquiry Technique	Project Activity
Individual	Farmers beneficiaries	5 respondents per village	– Structured Survey with farmers	Adoption of climate resilient agriculture practices at individual farm level . This includes interventions like plantation on individual land, drip irrigation, shade net, poly house, integrated farming systems, individual farm ponds etc.
				Demonstration of climate resilient agronomic practices through Farmer Field Schools(FFS)
				Adoption of integrated farming systems . This includes small ruminants, backyard poultry, sericulture, apiculture, inland fisheries, other agro based livelihoods
Community	Farmers beneficiaries	10 respondent per village	– Structured Survey with farmers	Development of community structures of watershed management This includes interventions like check dams , community farm ponds etc.
				Promoting Farmer Producer companies
Individual/ Community	VCRMC Representatives	1 discussion with VCRMC representatives per cluster(in project clusters)	– Discussion with VCRMC Representatives	Investigation on all project activities implemented in their village (capacity building, implementation, challenges, and suggestions for course correction)
Community	FPC Representatives	1 FPC Representative interview per cluster(for the sampled clusters which have FPCs)	– IDI with FPC Representatives	Investigation on support from PoCRA (support received , process bottlenecks, and suggestions for course correction)
Individual/ Community	Project Specialists(PS Agriculture, PS Agribusiness, PS HRD, PS Procurement)	Discussion with Project Specialist in all eight project districts	– Discussion with Project Specialists(with PSs implementing PoCRA at district level)	Investigation on all project activities implemented in their district (implementation, challenges, and suggestions for course correction)

	PoCRA in district			
Individual/ Community	SDAO	IDI with SDAO's of sub divisions sampled for concurrent monitoring	– IDI with SDAO	Investigation on all project activities implemented in their district (implementation, challenges, and suggestions for course correction)
Individual/ Community	Agriculture Assistant	IDI with Agriculture assistants of all project sampled villages(in round 1). TBD for each round	– IDI with AA	Investigation on all project activities implemented in their district (implementation, challenges, and suggestions for course correction)
Individual/ Community	Cluster Assistant	IDI with Agriculture assistants of all project sampled villages(in round 1). TBD for each round	– IDI with CA	Investigation on all project activities implemented in their district (implementation, challenges, and suggestions for course correction)
Individual/ Community	DSAO/PD ATMA	IDI with DSAO and PD ATMA in all eight project districts	– IDI with SDAO	Investigation on all project activities implemented in their district (implementation, challenges, and suggestions for course correction)

Measuring Village Climate Resilient Management Committee strengthening

As part of institutional strengthening imperatives towards climate resilient agriculture, Village Climate Resilient Management Committee (VCRMC) are being constituted and strengthened in the project target area. The VCRMCs are responsible for first level validation of beneficiaries for Individual Farmers Matching Grants, and execution of community works and implementation of mini watershed plan in their village. With the VCRMC being one of the key levers for institutionalization and sustainability, VCRMC strengthening would be investigated during concurrent monitoring. Customized tool would be developed in close collaboration with key POCRA personnel for capturing intended VCRMC mandate and functioning. Important dimensions to be probed would be-constitution, meetings, participation, decision-making, documentation-the same being finalized through collaborative processes. Specific probes under the aforementioned dimensions would be developed along with a scoring protocols. A summative aggregate rating scale would be developed to use the aggregate score for describing institutional strength of the assessed VRCMCs. Aggregate scale could be an institutional health scale- weak to strong or sustainability scale-unsustainable to highly sustainable.

3.2.4 Deliverables

Assessment reports for each concurrent progress monitoring with the relevant deidentified datasets=12 reports.

3.3 Learning and Dissemination

The evaluation framework proposed will have an embedded aspect of learning apart from monitoring and evaluation. We propose to conduct six-monthly findings sharing workshop along with the PMU. This mechanism is aimed at timely sharing of the findings so that the stakeholders can take corrective action.

3.3.1 *Data Collection and Assimilation*

The data will be collected using program developed on CSPro or using Sambodhi's survey application "Survey Point". This will allow in electronic data collection at a near to real time basis which would ensure high standard of data quality. Following is an illustration of data collection using survey point.

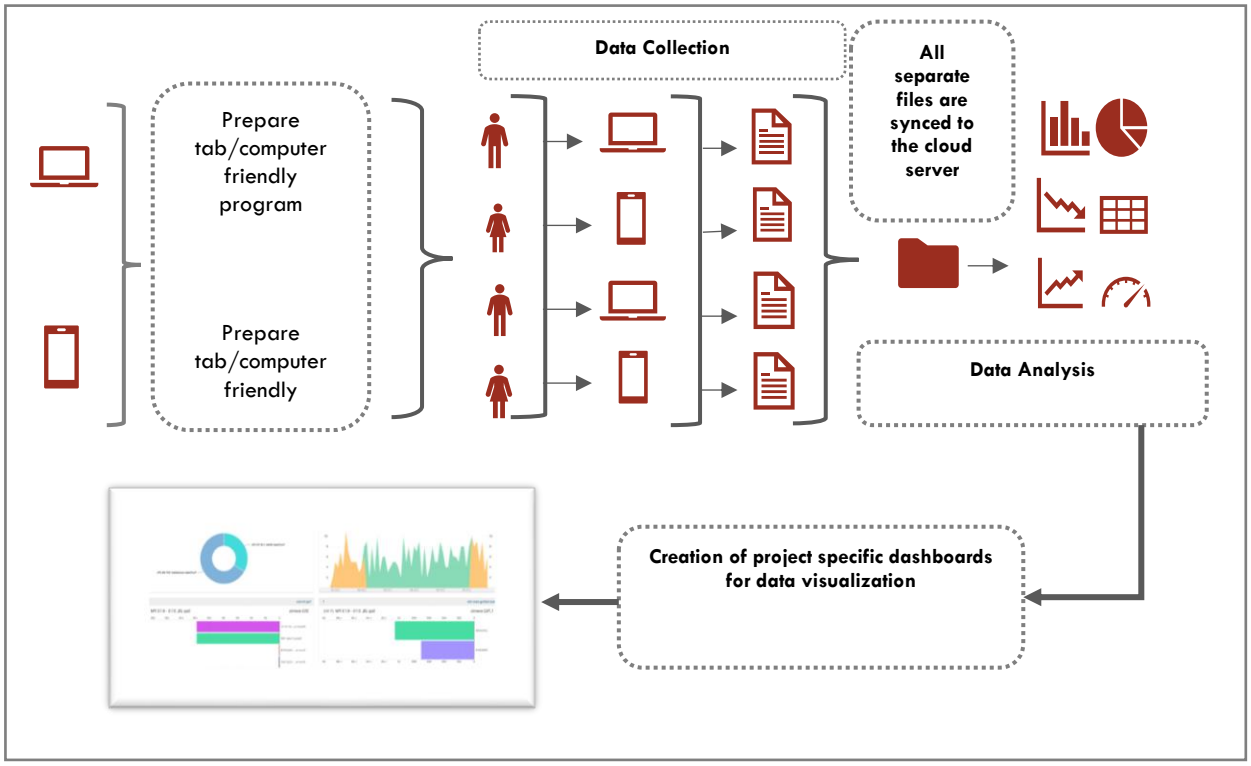


FIGURE 15:DATA COLLECTION AND ASSIMILATION PROCESS

3.3.2 *Analysis Plan*

Impact Evaluation will try and answer the following questions: (1) What is the causal impact of the program? and/or (2) What is the most effective method for achieving impact? The focus on causality and attribution is the hallmark of IE and determines the methodologies that can be used.

To address the questions mentioned above, there are several potential analysis modules and plans that have been identified by the assessment team. An in-house analytical division will provide continuous support to the evaluation team during data collection and reporting. The analytical framework for evaluation will use both quantitative data and qualitative insights to measure the overall findings. Based on this design, we will segregate the analysis into qualitative and quantitative components:

Some of the planned **quantitative analysis** are as follows:

I. Estimation of Average Impact Using:

a. *Descriptive and distribution analysis* – Basic descriptive analysis will be done to check the distribution of data. Histograms and frequency runs will be done to understand trends in data and check for any potential anomalies.

b. *Disaggregated and comparative analysis* – Following the basic descriptive analysis, the evaluation team will conduct disaggregated and comparative analysis on key indicators of interest. Disaggregation and comparison across project/comparison, region/villages, richer/poorer households and other demographics, will allow sharper insights into the field realities. We will also conduct tests of significance while conducting disaggregated and comparative analysis to comment on whether the differences, if any, are statistically significant.

c. *Tests of significance* – Significance testing is an essential component of any analysis plan, and we suggest using techniques such as Chi-Square tests, t-tests and Anova to find out whether emerging data trends are statistically significant. We will use Stata 13.0 to test for statistical significance.

d. *Causal analysis* – Cause and effect relationship between outcome variables and covariates will be assessed using correlation and regression modules. We will run correlation to check for association, while regression will be used to control unobserved factors and check for attribution.

e. *Impact analysis using DID design: The impact analysis of the project on the key PDO level indicators will be done using Difference in Difference evaluation design. Stata 13.0 will be used for analyzing the impact of the project on its key PDO level indicators.*

Qualitative Analysis

The research team for this assignment will also develop a dedicated process for conducting the qualitative analysis. Framework method (Gale et al, 2013) will be followed to analyse and present qualitative data. The following steps will be adhered to –

(1) Transcribing data – The audio recordings collected during data collection will be transcribed verbatim by a professional transcriber.

(2) Familiarization – Members of the research team will thoroughly read and re-read each transcript and listen to audio-recorded interviews to become familiar with the whole dataset. This process of familiarization will be essential in cases where the researcher analysing data had not been present during the interview.

(3) The enumerators under supervision from research manager and deputy team leader will work simultaneously to develop the Coding Frame. Once the coding frames are developed, the research team will discuss and compare each coding frame and the rationale behind it. This exercise will help ascertain the exhaustiveness of the constructs covered under the coding frame.

(4) The structuring and generation of the coding frame will be done using a combination of two strategies:

a. In a concept driven way; i.e. based on what the researchers already knew from the literature review and field insights.
b. In a data driven way i.e. by letting the categories/dimensions emerge from the collected data.
c. The combination of these two strategies will enable researchers to incorporate both deductive and inductive processes.

(5) Developing categories & themes - The final categories/themes and subcategories will then be defined by the research team using examples. A category/theme will contain codes that are the aspects of the data that point to that specific category/theme. Examples help further in illustrating the categories/themes. This exercise will help in improving the reliability of the coding frame through –

a. Uni dimensionality: Each dimension in the coding frame would capture only one aspect of the material.
b. Mutual Exclusiveness: Each unit of coding could be assigned to only one subcategory within a given dimension or main category.

3.4 Quality Assurance Mechanisms

Ensuring quality of data will be a priority throughout the entire assignment. All aspects — including survey design, questionnaire development, training of field staff, selection of respondents, data collection, data analysis etc. — will adhere to rigorous quality standards.

Ensuring data quality will not just be restricted to during the data collection phase but will also encompass pre- and post- data collection phases as well. The measures adopted during these three stages i.e. Preparatory (Pre-Data Collection), Execution (During Data Collection) and Analytical (Post – Data Collection) will have uniformly strenuous quality checks and standards.

3.4.1 Risk Identification and Mitigation Strategy

Prior to rolling out the data collection phase, Sambodhi's core team will ensure that all steps have been taken to mitigate any future risks. We will develop a risk mitigation plan for the smooth roll-out and supervision of the data collection. The risk mitigation strategy would also include inputs and feedback from key stakeholders.

Apart from the quality assurance mechanisms put in place for projects of this nature, an internal committee on overseeing risk factors pertaining to the execution of the project is constituted. The Risk Identification and Mitigation Planning (RIMP) committee is tasked with the responsibility of ensuring all and any risks associated with projects during the pre-commissioning or execution stage are identified and dealt with in an appropriate and responsible manner. For the current project the same is intended. The constitution of the committee is typically made up of the following personnel:

- Project Leader (Team Lead/Project Manager)
- Thematic Advisor
- Functional Advisor (Survey/Statistical Expert)
- Chief Operating Officer
- Finance & Administration Head
- Human Resource Officer
- Duty of Care Officer

The primary responsibility and objective of the committee is to identify, manage and mitigate risks to the project. As a part of this broader goal, the following sub-objectives and steps are carried out

1. Develop a comprehensive risk strategy for the project which would cover all perceived risks including but not limited to:
    a. Execution/operational risk (including time, quality and ethical compliance)
    b. Human resources and staffing risk
    c. Financial risk
    d. Geographical risk
    e. Health, Safety and Security (including Duty of Care) risk
2. Develop a detailed risk identification and mitigation plan (RIMP) which can be integrated into the overall project plan. The RIMP details the comprehensive risk assessment process.
3. Incorporate learnings, whether tangible or not, from the collective previous experiences of Sambodhi's projects as well as from individual learnings of the members of the risk committee. This translates into an active prevention mechanism.
4. Institute a tangible mechanism for identifying and mitigating risks. This may employ approaches such as concurrent monitoring and analysis of perceived risk factors as well as tools such as progress dashboards, heat maps, 2x2 matrices, probability-severity graphs, risk reports etc
5. Practices such as prototyping, pre-testing and systems testing are also utilized in projects of the current projects nature to ensure that any previously unidentified risks or issues can be captured and mitigated in time
6. Provision of periodic risk and mitigation reports as well as progress reports for specific risks identified.
7. Root cause analysis of an identified and mitigated risk to ensure incorporation of factors and learnings in the prevention mechanism for ongoing and future executions and operations.
8. Concurrent and constant capacity building

The Risk Identification and Mitigation Plan

The RIMP itself is a process comprising of identification of potential risks and the risk assessment process. An output of the RIMP process is the documented plan itself which is dynamic in nature and is updated as per the needs of the project. The plan is re-visited periodically to ensure consistency with the overall project progress and the detailed project plan. Based on the plan, the mitigation measures planned are translated into actionable items – a response to the risks identified.

Within the RIMP, the risk assessment process follows risk identification and precedes risk response. Its purpose is to assess how big the risks are, both individually and collectively, in order to focus the risk committee's attention on the most important threats and opportunities, and to lay the groundwork for risk response.

Risk assessment is about identifying, measuring and prioritizing risks and planning mitigation steps so that mitigation actions can be developed and instituted to counter the risks. The below figure depicts steps of the risk assessment process

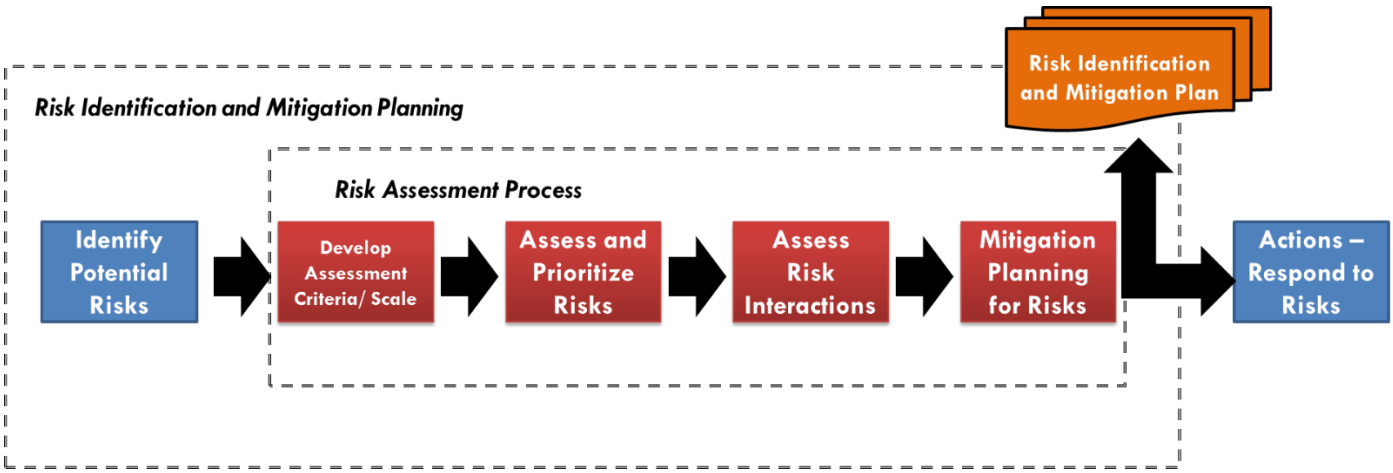


FIGURE 16: STEPS TO BE FOLLOWED FOR RISK IDENTIFICATION AND MITIGATION PLANNING

Identify Potential Risks – An initial step in planning for risk is to identify all potential risks to the project. This is a dynamic process and has to be conducted at a frequency decided by the risk committee throughout the project lifecycle. As the project progresses further risks can be identified, and mitigation measures can be put in place. The risks identified are categorized by the nature of the risk for e.g. financial, operational, strategic, compliance, security etc. At this stage, a wide net is cast to understand the universe of risks making up the project's risk profile.

Develop Assessment Criteria - The first activity within the risk assessment process is to develop a scoring/measurement framework encompassing common set of assessment criteria to be deployed across the project. Risks are typically assessed in terms of impact and likelihood. Additional parameters which may be project specific can be utilized as well. A scale is developed to weigh the risks according to the parameters defined.

An illustrative criterion is shown below:

TABLE 14: RISK IMPACT SCALE

Illustrative Impact Scale		
Weight/Score	Descriptor	Definition
5	Extreme	Criteria defined as per nature of project for e.g. with respect to areas such as Time Loss-Delays, Quality Issues, Ethical Compliance, Human Resource Issues, Financial Implications, Physical Security, Health and Safety etc
4	High	
3	Medium	
2	Low	
1	Incidental	

Assess and Prioritize Risks - Assessing risks consists of assigning values or scores to each risk identified using the criteria defined. The assigning of values as per the criteria defined is usually carried out through a mixed – method approach of utilizing both qualitative and quantitative analysis as a result of which a final score/weight is assigned to every identified risk. Based on the final scores a risk prioritization mapping may be carried out.

Assess Risk Interactions - Risks do not exist in isolation. Projects have come to recognize the importance of managing risk interactions. At times outwardly non-critical risks can potentially, as they interact with other events, processes and parameters, trigger impairment to a project. A unified, integrated and holistic view of risks using techniques such as risk interaction matrices, bow-tie diagrams, and aggregated probability distributions is developed wherever required.

Practices such as prototyping, pre-testing and systems testing are also utilized in projects to ensure that any previously unidentified risks or issues can be captured and mitigated in time.

Mitigation Planning for Risks – Once identified, a comprehensive mitigation plan for each risk identified (or in certain cases, a group of risks) is developed. The mitigation plan considers the above factors including

interactions. The risk committee endeavours to ensure that the plan can translate into tangible and actionable items.

The culmination of the above activities is a deliverable known as the **Risk Identification and Mitigation Plan** which essentially lists and defines various risks identified, prioritizes them, provides actionable options and serves as the primary input to action to be taken to avert and/or mitigate risks

Action: A Response to Risk – The RIMP details the actions to be carried out to avert and/or mitigate identified risks. The risk committee allocates responsibility to various organizational resources and follows up on the action taken and results thereof.

3.4.2 Field Quality Control Mechanisms

The schematic below illustrates the various steps and measures that Sambodhi intends to pursue to ensure quality during the preparatory phase

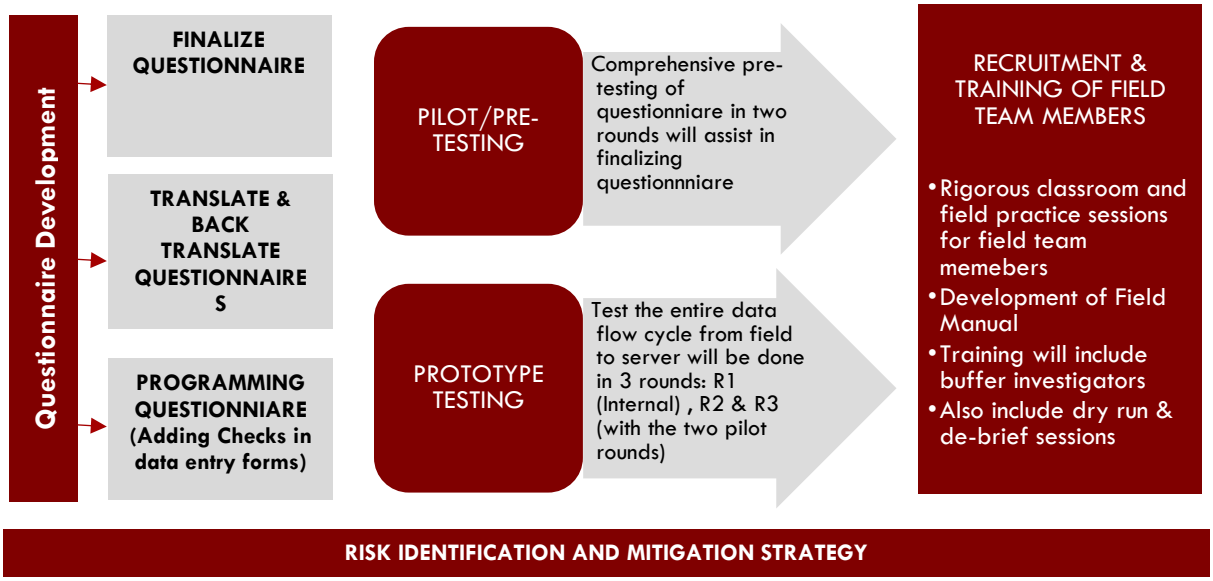


FIGURE 17: QUALITY ASSURANCE MECHANISMS DURING THE PREPARATORY PHASE

A. Risk Identification and Mitigation Strategy

Prior to rolling out the data collection phase, the core team for monitoring and evaluation will ensure that all steps have been taken to mitigate any future risks. Sambodhi's internal Risk Identification and Mitigation Planning (RIMP) Committee will develop a risk mitigation strategy that will address any future risks that may crop up during any phase of the execution. The risk mitigation strategy would also include inputs and feedback from key stakeholders, including the project steering committee.

B. Questionnaire Development

This stage will primarily comprise of three sub-activities i.e.

- Finalizing the questionnaire
- Translation into vernacular language
- Programming the questionnaire

It is proposed that the study shall be carried on CSPro software. Using CSPro shall aid in quicker data pooling, effective monitoring and faster data analysis. The data entry form developed in CSPro will also have checks and measures to eliminate obvious entry errors i.e. **Validity checks –** to ensure that all fields are entered and no answer field is blank, **Range Checks-** to ensure that value entered falls between a permissible limit (ex: if the age of a respondent is beyond a normal value a pop up window would apprise the investigator of the same) & **Skips-** the various skips and logical checks from the questionnaire will also be incorporated in the CSPro data entry form. CSPro data entry app will be developed after rigorous rounds of testing (both internal & external) and therefore, the data that will be gathered from the field will be in readily-usable form.

C. Pilot Testing of Research Instruments

All the research instruments developed for the study shall be thoroughly tested in order to ascertain their suitability in actual field conditions. It will help in identifying questionnaire problems as well as help in removing ambiguities and other sources of bias and error.

Prototype Testing: Since data collected from the field will directly feed into servers and dashboards at near real-time frequency, it is imperative that the data flow channel is thoroughly pre-tested before the launch of training and survey work. The pro-type will be thoroughly tested internally before the pilot study, during the pilot study and once after the pilot testing.

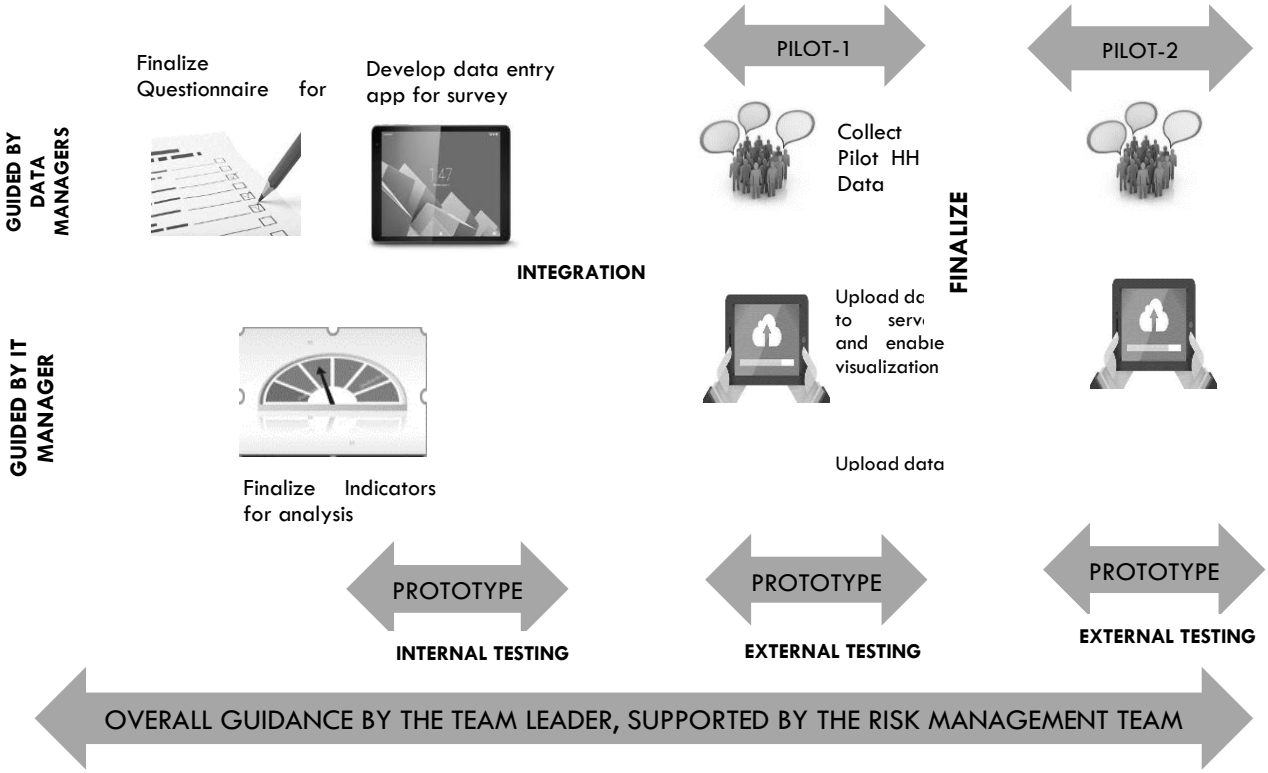


FIGURE 18:PILOT TESTING OF RESEARCH INSTRUMENTS

D. Developing Detailed Field Manuals/ Guide for Data Collection:

Sambodhi proposes to have a field guide/manual ready for the study before initiation of field training. Development of the field guide/manual for data collection is quintessential for ensuring smooth functioning of field operations.

It is proposed to share a draft manual with client team to receive their feedback and suggestion on the same. After incorporating these comments, the manual will be shared with the field team members on the first day of the training. Sambodhi proposes to prepare a bilingual survey manual which would serve as ready reference for all research and field staff. It shall broadly consist of:

- Background and research objective
- Research design and methodology followed
- Role and task of research and field staff
- Quality control mechanism in the field
- Process of scrutiny at field

- Brief description of key questions and way to ask/interpret for each survey instruments

E. Recruitment & Training of Field Team Members

A training curriculum comprising of the content and schedule would be developed and shared. Training for survey teams including enumerators and supervisors will be conducted to explain the survey objectives, survey tools, sampling design and expected data quality. ***Separate training would be conducted for the listing team. The Listing supervisor would also be trained in the nuances of drawing village maps.*** The training will consist of a combination of classroom training and practical experience

F. Data Collection/ Execution Phase

The field in-charge and supervisors will be directly responsible for ensuring that the data collection norms are adhered to. Also, directly responsible will be the state coordinator & Quality Control coordinators. The quality coordinators will also undertake various rounds of back-checks and spot-checks. Some of the various quality checks that we propose to implement during this stage are:

Macros for data cleaning: It is pertinent to note that data cleaning should exist in parallel with the data collection. In reality, one of the essential elements of data cleaning is to identify and spot erroneous issues, and flag them off to the data collection team prior to them leaving the village. In order, to ensure the same, the Sambodhi Centralized Quality & Processing Team will build in a customized macro for instantly identifying issues emanating from data collection. Data collected by the enumerators will be uploaded to the cloud server and linked with the project dashboards, however a copy of the same will be stored in Sambodhi's internal server (refer the data sharing protocol schematic illustration below). Once the data is uploaded on Sambodhi's server it will be parsed through this macro, and erroneous issue will be identified and flagged. The Central Processing team will notify these issues to the quality coordinators, who in turn will enquire from the data collection team and if needed make re-visits. The entire process will take place simultaneously with the data collection activities, as the sole purpose of the entire process is to provide instantaneous feedback to the field team.

Cloud Servers with password protected

24 hours post the completion of a PSU, data would be uploaded on cloud servers linked with dashboards. Password protected access will be made available

Sambodhi Internal Servers

Back-up of data will be maintained at Sambodhi's Internal servers. Data stored here will be parsed through Macros to identify issues for course correction or re-visits.

FIGURE 19:DATA BACKUP PROCESS

Spot Checks: Spot-checks are pertinent to observe the enumerator, and how he/she is asking the questions and soliciting the answers. Care will be taken during spot-checks to not influence the interview (avoid the impact of Hawthorne Effect). Spot Checks and observations will basically be guided by the below mentioned principles:

- Observe some of the interviews, to ensure that investigator is conducting well, asking the questions in the right manner, and interpreting the answers correctly;
- Spot check some of the addresses selected for interviewing to be sure that investigator is interviewing the right household and the eligible respondent;
- Help to solve any problems that investigator might have with finding assigned households, understanding the concepts in the questionnaire or with difficult respondents.
- Conduct 10% spot checks of household interview. Feedback of the spot check would be communicated to the Investigators daily to minimize errors.

Back Checks/ Re-interviews: A powerful tool in checking the quality of the data is to systematically check the information for households. This is done by conducting a short re-interview/back check in some households and checking the results with what was collected by the investigator.

The field supervisors & Quality Coordinators will be asking some of the key questions and will note down the answers. Before leaving the field, he/she will check the data of the same household with the original interview and will match both the data for the selected questions. In case of any mis-match, the supervisor and the particular investigator will visit that household again to resolve the issues. A back-check report will also be made and shared with the Client team.

G. Post Data Collection Phase

Data validation and cleaning is a crucial step in any kind of large-scale survey and Sambodhi gives special efforts to it. Sambodhi has an experienced and focused team dedicated for data management, validation and cleaning. The Data managers and coordinators will be executing this activity. Data will be validated and cleaned by a trained team on a regular basis. They would generate error reports and share with the concern teams so that they don't repeat the same mistake. The data cleaning protocol that will be followed by Sambodhi, will primarily be guided by the below three principles:

1. **Validity Check:** It shall look at one question field or cell at a time. They check to ensure the record identifiers, invalid characters, and values have been accounted for; essential fields have been completed (e.g. no quantity field is left blank where a number is required); specified units of measure have been properly used; and the reporting time is within the specified limits.
2. **Range Checks:** For data fields containing information about a continuous variable e.g. age, income etc., observations should fall within a specified range. Thus, if the age of a child falls outside the normal range it should be checked.
3. **Consistency Checks:** Often certain combinations of within-range values of different variables are either logically impossible or very unlikely. Data entry programme shall have some checks to ensure data consistency.

4. Work Plan

The following section provides a narrative description of the major tasks to be completed for each of the baseline, midline, Endline and concurrent monitoring (12) rounds. This is followed by a quarterly M&E implementation timeline and the description of the major deliverables and monthly timeline.

Internal briefing and Planning: The evaluation team propose to have a detailed meeting with PMU at the inception of the assignment to gain a thorough understanding of the project and its objective as well as the study design in consultation and mutual agreement on the following parameters. The mentioned protocols and quality assurance will be rigorously followed through all the study phases.

Developing Theory of change: During the inception phase, along with finalization of study methodology, Theory of Change will be developed in consultation with the client so that the approach in which the evaluation has been proposed is fulfilled. It will also help streamline the expected results and their achievement pathways.

Finalization of sample: The sample will be finalized according to the sampling plan mentioned in the earlier section. Any changes or parameters deemed important would be altered at this level.

Finalization of Areas of Enquiry and Tools preparation: The tools will be prepared by the evaluation team and shared with PMU for finalization and approval. On the confirmation of final set of tools, these will be translated in Marathi for administering during investigator visits to the field.

Field team recruitment: Evaluation will place field team with relevant experience and exposure to carry out the proposed exercises. It will have to be ensured that female investigators are present to interview the female respondent. Field team will be well versed in Marathi language.

Training module: A training module for training and orienting the field team on various aspects of the project on background, sampling, tools, data collection, and scrutiny and data management will be prepared.

Pre-testing and training of field teams: The pre-testing of the tools would be managed by the core team members, research and field manager. The pre-test would assist in assessing the time taken to administer the tools, whether questions are framed / translated in a manner that is easy to ask and is understood by the respondents (observation tool/questionnaire), other logical and consistency checks in the tool.

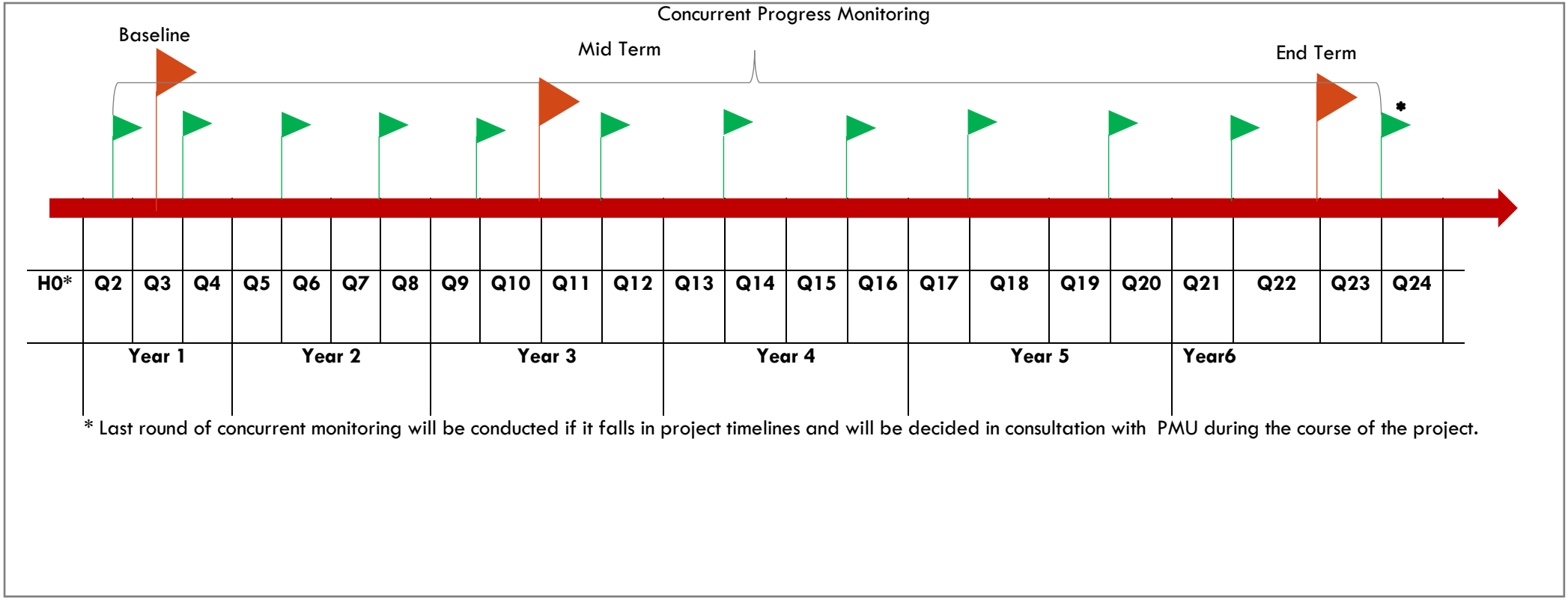
Data Collection: Having understood the characteristics of the study and the complete familiarization with the tools and the survey design, the core team members along with field team will plan the field work and logistics to start the field work.

Analysis plan and analysis framework: As soon as the data collection is initiated, the evaluation team will develop analysis frame in close consultation with PMU for identifying key indicators in line with the project requirement. This will be based on the overall objective of the assignment and tool design. This is an important step that would eliminate any confusion or ambiguity in the scope of final reporting and interpretation of data by the investigators, or the researchers.

Data analysis and preparation of Report: Initially a draft report will be shared with the client in accordance with the scope of the research identified at the outset and the analysis plan that has been shared with the client. The draft report would be shared with client for inputs. The research report would be finalized by incorporating the feedback from client.

Quality Assurance: Ensuring quality of data will be a priority throughout the entire assignment. All aspects — including survey design, questionnaire development, training of field staff, selection of respondents, conducting interviews and verification, field as well as office editing, upload of data etc.

FIGURE 20: M&E IMPLEMENTATION TIMELINE



* Last round of concurrent monitoring will be conducted if it falls in project timelines and will be decided in consultation with PMU during the course of the project.

5. Key Deliverables

The below are the list of deliverables:

TABLE 15: LIST OF KEY DELIVERABLES

No.	Deliverables No.	Particulars	Timeline – Month X out 78*
1.	Deliverable 1 (D1)	Inception Report	March 2019 (Month 1) (Within 15 days of the signing of the contract)
2.	Deliverable 2 (D2)	Baseline Report and Relevant Datasets	August 2019 (Month 6) (within 6-months of signing of contract) *
3.	Deliverable 3 (D3)	Midterm Assessment Report and Relevant Datasets	June 2021 (Month 28)
4.	Deliverable 4 (D4)	End-term Assessment Reports and Relevant Datasets	June 2024 (Month 63) (One Month Prior to the closure of Project in 2024)
5.	Deliverable 5 (D5)	Submission Assessment Reports for Progress Monitoring Round-1	May 2019(Month3)(Submitted in first month of every six-monthly cycle till the end of the Project period)
6.	Deliverable 6 (D6)	Submission Assessment Reports for Progress Monitoring Round-2	October 2019 (Month 8)
7.	Deliverable 7 (D7)	Submission Assessment Reports for Progress Monitoring Round-3	April 2020 (Month 14)
8.	Deliverable 8 (D8)	Submission Assessment Reports for Progress Monitoring Round-4	October 2020 (Month 20)
9.	Deliverable 9 (D9)	Submission Assessment Reports for Progress Monitoring Round-5	April 2021 (Month 26)
10.	Deliverable 10 (D10)	Submission Assessment Reports for Progress Monitoring Round-6	October 2021 (Month 32)
11.	Deliverable 11 (D11)	Submission Assessment Reports for Progress Monitoring Round-7	April 2022 (Month 38)
12.	Deliverable 12 (D12)	Submission Assessment Reports for Progress Monitoring Round-8	October 2022 (Month 44)
13.	Deliverable 13 (D13)	Submission Assessment Reports for Progress Monitoring Round-9	April 2023 (Month 50)
14.	Deliverable 14 (D14)	Submission Assessment Reports for Progress Monitoring Round-10	October 2023 (Month 56)

No.	Deliverables No.	Particulars	Timeline – Month X out 78*
15.	Deliverable 15 (D15)	Submission Assessment Reports for Progress Monitoring Round-11	April 2024 (Month 62)
16.	Deliverable 16 (D16)	Submission Assessment Reports for Progress Monitoring Round-12	TBD*
17.	Deliverable 17 (D17)	Mid-term ESMF Audi Report	June 2021 (Month 42)
18.	Deliverable 18 (D19)	Endline ESMF Audit Report	June 2024(Month 63) (Around project closure in 2024)

*The time line for last round of survey will be decided on the progress and timelines of the project in consultation with PMU

6. Work Schedule and Planning for Deliverables

The following section list the deliverables with the breakdown for activities required to produce them and other benchmarks. The charts provided below are for the baseline, midline, Endline, first concurrent monitoring round and rounds 2-12 of concurrent monitoring.

TABLE 16: TIMELINE FOR BASELINE

D #	Activities	April 2019 (M1)				May 2019(M2)				June 2019(M3)				July 2019(M4)				August 2019(M5)				Total weeks
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
D1	Inception Report with proposed methodology																					1
	- Finalization of M&E framework for the study																					2
	- Preparing the sampling methodology																					2
	- Preparation of Study Tools																					2
	- Pretesting of Tools and Submission of Final Tools																					1
	- Conducting sampling for baseline study																					1
	- Training of Field Enumerators																					1
	- Data Collection																					4
	- Data Collation, Compilation																					2
	- Data Analysis																					2
	- Preparation and Submission of Draft Baseline Report																					3
D2	- Submission of Baseline Data																					1

TABLE 17: TIMELINE FOR MID TERM EVALUATION

Deliverables	Activities	March 2021(M1)				April 2021(M2)				May 2021(M3)				June 2021(M4)				Total Weeks
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
D3, D17	Final Mid Term Report (including Mid line ESMF Audit Report)																	**16**
	- Revisit Study Methodology, Sampling Design																	2
	- Submission of Mid-term Final Methodology and Sampling Design																	2
	- Preparation of Study Tools (including ESMF Audit Checklists)																	1
	- Pretesting of Tools and Submission of Final Tools																	1
	- Training of Field Enumerators																	1
	- Data Collection (including for ESMF Audit)																	4
	- Data Collation, Compilation																	2
	- Data Analysis																	3
	- Preparation and Submission of Draft Mid Term Report																	3
	- Preparation and Submission of Final Mid Term Report (including ESMF Audit Reports)																	3
	- Submission of Mid Term Data																	1

TABLE 18: TIMELINE FOR END TERM EVALUATION

Deliverables	Activities	March 2024(M1)				April 2024(M2)				May 2024(M3)				June 2024(M4)				Total Weeks
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
D4, D18	Final Endline Report (including ESMF Audit Reports)																	**16**
	- Revisit Study Methodology, Sampling Design																	1
	- Submission of Final Methodology and Sampling Design																	1
	- Preparation of Study Tools																	1
	- Pretesting of Tools and Submission of Final Tools																	1
	- Training of Field Enumerators																	1
	- Data Collection (including for GHG Accounting and ESMF Audit)																	4
	- Data Collation, Compilation																	2
	- Data Analysis (including for GHG Accounting and ESMF Audit Reports)																	3
	- Preparation and Submission of Draft Endline Report																	4
	- Preparation and Submission of Final Endline Report (including GHG Accounting and ESMF Audit Reports)																	3
	- Submission of End Term Data																	1

TABLE 19: TIME FOR CONCURRENT PROGRESS MONITORING (ROUND 1)

Deliverables	Activities	April 2019(M1)			May 2019(M2)				Total Weeks
		2	3	4	5	6	7	8	
D5	Concurrent Monitoring Report (Round 1)								**1**
	- Preparation of Concurrent Progress Monitoring Implementation Plan								1
	- Preparation of Study Tools								2
	- Sampling for Concurrent monitoring								1
	- Pretesting of Tools and Submission of Final Tools								1
	- Training for data collection								1
	- Data Collection								3
	- Data Collation, Compilation								1
	- Data Analysis								2
	- Preparation and Submission of Monitoring Report or presentation								1

TABLE 20: TIMELINE FOR CONCURRENT PROGRESS MONITORING (ROUND 2 TO 12)

Deliverables	Activities	Month 1				Month 2				Month 3		Total Weeks
		1	2	3	4	5	6	7	8	9	10	
D6-D16	Concurrent Monitoring Reports (Round 2-12)											**10**
	- Revisiting Concurrent Progress Monitoring Implementation Plan											1
	- Revisiting Methodology and Tools											1
	- Pretesting of Tools and Submission of Tools											1
	- Orientation of research managers and enumerators											2
	- Data Collection											4
	- Data Collation, Compilation											2
	- Data Analysis											2
	- Preparation and Submission of Monitoring Report											2
	- Preparation and Submission of Final Monitoring Report											1
	- Learning and Dissemination											1

7. Team Composition and Tasks Assigned

The below table provides a snapshot of key expertise and task to be performed by the experts in the study.

TABLE 21:TEAM COMPOSITION AND TASKS ASSIGNED

#.	Name of Expert	Proposed Position	Relevant Education Qualifications & Years of Experience	Detailed Tasks Assigned
A. Key Experts				
1.	Dharmendra Chandurkar	Monitoring & Evaluation Expert and Team Leader	Post Graduate Diploma in Forestry Management, IIFM, Bhopal **Experience**: 18 Years	• Overall lead and contact person for project • Responsible for ensuring efficient and timely submission of all deliverables in a quality driven manner • Research design for Evaluation (Baseline, Midline, Endline), concurrent progress and process monitoring, GHG Accounting, ESMF Audits and any special studies • Sampling methodology and sampling frame etc • Review/revisit of log frame indicators • Finalizing the sampling methodology and frame • Overseeing development of tools for all components of the project • Overseeing training of investigators and pre-testing for all components of the project • Monitoring the progress of all components of the project • Data analysis for all components of the project • Lead for report writing for all components of the project • Project management • Stakeholder management and meetings • Quality Assurance • Risk Management • Responsible for submission of all project deliverables
2.	Prakashkiran Pawar	Agronomy Expert	Ph.D Natural Resources, Centre for Regulatory & Policy Research,TERI University	• Thematic expert • Supporting the Team Lead with carrying out the assignment • Support the overall execution of the project • Input to Evaluation Design

#.	Name of Expert	Proposed Position	Relevant Education Qualifications & Years of Experience	Detailed Tasks Assigned
			M.E. Irrigation & Water Management, Soil & Water Conservation Engineering MP University for Agriculture & Technology, Udaipur, (India) B.Tech in Agriculture Engineering, Mahatma Phule Agricultural University, Ahmednagar **Experience:** 18 Years	• Input on sampling methodology and frame etc • Input to tools • Provide thematic expertise in Agronomy wherever required – especially dryland agriculture and farming systems, farm based technologies, traditional practices and modern techniques for improving water use efficiency and agricultural productivity – for relevant components of the project • Interface with the client in workshops, dissemination meeting, stakeholder meetings • Input on quantitative and qualitative survey instruments for relevant components of the project • Field visits, data collection (interviews), observatory visits etc for relevant components of the project • Input on developing the data analysis plan and data analysis • Input and review on report writing • Input on all relevant deliverables including inception report, evaluation reports, monitoring reports and special studies if any
3.	Deo Datt Singh	Agri-Business Expert	Master of Science (Plant Pathology), Govind Ballabh Pant University of Agriculture and Technology **Experience:** 19 Years	• Thematic expert • Supporting the Team Lead with carrying out the assignment • Support the overall execution of the project • Input to Evaluation Design • Input on sampling methodology and frame etc • Input to tools • Provide thematic expertise in Agri business wherever required – especially agricultural value chain analysis, access to finance, access to markets, markets expertise, access to technology etc – for relevant components of the project • Interface with the client in workshops, dissemination meeting, stakeholder meetings • Input on quantitative and qualitative survey instruments for relevant components of the project • Field visits, data collection (interviews), observatory visits etc for relevant components of the project • Input on developing the data analysis plan and data analysis

#.	Name of Expert	Proposed Position	Relevant Education Qualifications & Years of Experience	Detailed Tasks Assigned
				• Input and review on report writing • Input on all relevant deliverables including inception report, evaluation reports, monitoring reports and special studies if any
4.	Dalbir Singh	Agri Economist	Ph.D in Economics, H.P University, Shimla M.A in Economics, H.P University, Shimla **Experience:** 30+ Years	• Thematic expert • Supporting the Team Lead with carrying out the assignment • Support the overall execution of the project • Input to Evaluation Design • Input on sampling methodology and frame etc • Input to tools • Provide thematic expertise in Agri business wherever required – especially agricultural economics, economic analysis of irrigation and water management projects and practical understanding of field level issues and financial and economic cost benefit analysis etc – for relevant components of the project • Interface with the client in workshops, dissemination meeting, stakeholder meetings • Input on quantitative and qualitative survey instruments for relevant components of the project • Field visits, data collection (interviews), observatory visits etc for relevant components of the project • Input on developing the data analysis plan and data analysis • Input and review on report writing • Input on all relevant deliverables including inception report, evaluation reports, monitoring reports and special studies if any
5.	Preeti Das	Social Development Expert	Ph.D in Sociology ,IIT Delhi & Post Graduate Diploma in Public Policy and Sustainable Development, TERI University **Experience:** 26 Years	• Thematic expert • Supporting the Team Lead with carrying out the assignment • Support the overall execution of the project • Input to Evaluation Design • Input on sampling methodology and frame etc • Input to tools • Provide thematic expertise in social development practices

#.	Name of Expert	Proposed Position	Relevant Education Qualifications & Years of Experience	Detailed Tasks Assigned
				• Carry out ESMF Audit along with other experts • Interface with the client in workshops, dissemination meeting, stakeholder meetings • Input on quantitative and qualitative survey instruments for relevant components of the project • Field visits, data collection (interviews), observatory visits etc for relevant components of the project • Input on developing the data analysis plan and data analysis • Input and review on report writing • Input on all relevant deliverables including inception report, evaluation reports, monitoring reports, ESMF audit and special studies if any
6.	T.S. Krishnan	Statistical Expert	M.Sc in Mathematics with specialisation in **Statistics**, University of Madras **Experience:** 50+ Years	• Statistical input to research design, sampling methodology and frame and survey tools for all relevant components of the project • Stakeholder discussions • Input on developing the data analysis plan and data analysis • Input and review on report writing
7.	Seema Kundu	GIS/MIS Expert	M.Sc. in Geoinformatics, TERI University **Experience:** 8 Years	• Thematic expert • Input on sampling methodology and frame etc • Input to tools • Responsible for preparing GIS maps, GIS layering and other GIS related activties • Field visits wherever required • Stakeholder discussions
8.	Vijay Kr. Agarwal	Agriculture Engineering Expert	M.Sc. Agriculture Engineering, Allahabad Agriculture Institute **Experience:** 40+ Years	• Thematic expert • Supporting the Team Lead with carrying out the assignment • Support the overall execution of the project • Input to Evaluation Design • Input on sampling methodology and frame etc • Input to tools • Provide thematic expertise in agricultural engineering practices, irrigation planning and management, soil water conservation etc

#.	Name of Expert	Proposed Position	Relevant Education Qualifications & Years of Experience	Detailed Tasks Assigned
				• Interface with the client in workshops, dissemination meeting, stakeholder meetings • Input on quantitative and qualitative survey instruments for relevant components of the project • Field visits, data collection (interviews), observatory visits etc for relevant components of the project • Input on developing the data analysis plan and data analysis • Input and review on report writing • Input on all relevant deliverables including inception report, evaluation reports, monitoring reports, ESMF audit and special studies if any
9.	Vijay Kumar	Hydrology Expert	M.E in Hydrology (University of Roorkee) and B.Sc. in Civil Engineering (R.E.C. Kurukshetra) **Experience:** 30+ Years	• Thematic expert • Supporting the Team Lead with carrying out the assignment • Support the overall execution of the project • Input to Evaluation Design • Input on sampling methodology and frame etc • Input to tools • Provide thematic expertise in hydrological planning and management • Interface with the client in workshops, dissemination meeting, stakeholder meetings • Input on quantitative and qualitative survey instruments for relevant components of the project • Field visits, data collection (interviews), observatory visits etc for relevant components of the project • Input on developing the data analysis plan and data analysis • Input and review on report writing • Input on all relevant deliverables including inception report, evaluation reports, monitoring reports, ESMF audit and special studies if any
10.	Arindam Datta	Environment Expert	PhD in Environmental Science & Master of Science in Environmental Science, University of Kalyani, West Bengal **Experience:** 15 Years	• Thematic expert • Supporting the Team Lead with carrying out the assignment • Support the overall execution of the project • Input to Evaluation Design • Input on sampling methodology and frame etc • Input to tools

#.	Name of Expert	Proposed Position	Relevant Education Qualifications & Years of Experience	Detailed Tasks Assigned
				• Provide thematic expertise in environmental sciences • Responsible for ESMF audit along with other experts • Responsible for GHG accounting with support from other personnel • Interface with the client in workshops, dissemination meeting, stakeholder meetings • Input on quantitative and qualitative survey instruments for relevant components of the project • Field visits, data collection (interviews), observatory visits etc for relevant components of the project • Input on developing the data analysis plan and data analysis • Input and review on report writing • Input on all relevant deliverables including inception report, evaluation reports, monitoring reports, ESMF audit, GHG accounting and special studies if any
B. Advisory Group and Team Member				
11.	Swapnil Shekhar	Project Advisor	Post Graduate Diploma in Forestry Management, IIFM, Bhopal **Experience**: 18 Years	• Mentor and guide the team in various aspects of the project including developing resilience-based frameworks for the purpose of an evaluative lens. • Providing thematic inputs in the evaluation design, research methodology, tools, analysis and report • Contribute in refining Theory of Change and research methodology by incorporating resilience and climate smart agriculture dimensions • Input on Tools • Review of Deliverables
12.	Ritu Dewan	Gender & Livelihood Economist and Advisor	PhD Economics, University of Bombay **Experience:** 18 Years	• Mentor and guide the team in various aspects of the project including developing resilience based frameworks for the purpose of an evaluative lens. • Providing thematic inputs in the evaluation design, research methodology, tools, analysis and report • Gender Equity and Inclusion analysis • Contribute in refining Theory of Change and research methodology by incorporating gender dimensions • Input on Tools • Review of Deliverables

#.	Name of Expert	Proposed Position	Relevant Education Qualifications & Years of Experience	Detailed Tasks Assigned
13.	Suruchi Bhadwal	Advisor – Monitoring and Evaluation (Climate Resilience)	M.Sc. in Environmental Sciences Experience: 19 Years	• Mentor and guide the team in various aspects of the project including developing resilience based frameworks for the purpose of an evaluative lens. • Providing thematic inputs in the evaluation design, research methodology, tools, analysis and report • Contribute in refining Theory of Change and research methodology by incorporating resilience and climate smart agriculture dimensions • Input on Tools • Review of Deliverables
14.	Ramanshu Ganguly	Research Manager Quantitative	Post Graduate Diploma in Forestry Management, IIFM, Bhopal **Experience**: 6 Years	• Supporting the Team Lead with carrying out the assignment • Support the overall execution of the project • Project management • Input to Design of Evaluation (Baseline, midline, endline), concurrent progress and process monitoring, GHG Accounting, ESMF Audits and any special studies) • Sampling methodology and frame etc for all relevant components • Interface with the client in workshops, dissemination meeting, stakeholder meetings • Responsible for development quantitative survey instruments • Training of investigators and field data collection • Quantitative Coordinator for concurrent process and progress monitoring • Data quality checks, protocols, and assurance • Responsible for developing the data analysis plan, data cleaning, data management and analysis • Responsible for development and finalization of the Inception report and other all other deliverables
15.	Kezia Yonzon	Research Manager Qualitative	Master's in Social Work with Community Organization and Development Practice, TISS, Mumbai **Experience**: 4 Years	• Supporting the Team Lead with carrying out the assignment • Support the overall execution of the project • Input to Design of Evaluation (Baseline, midline, endline), concurrent progress and process monitoring, and any special studies) • Sampling methodology and frame etc for all relevant components • Interface with the client in workshops, dissemination meeting, stakeholder meetings • Responsible for development qualitative survey instruments

#.	Name of Expert	Proposed Position	Relevant Education Qualifications & Years of Experience	Detailed Tasks Assigned
				• Training of investigators and field data collection • Qualitative Coordinator for concurrent process and progress monitoring • Data quality checks, protocols, and assurance • Responsible for developing the data analysis plan, data cleaning, data management and analysis • Responsible for development and finalization of key deliverables
C. Non - Key Experts				
16.	Sambodhi Data Manager - 1 (TBD)	Data Manager	Post-Graduation Degree **Experience:** 10+ Years	• Developing data entry platform. • Database management for handling large scale data. • Data quality checks and provide feedback to quality coordinator / supervisors. • Data Compilation, Validation and data cleaning. • Submission and basic analysis of data. • Maintenance of MIS
17.	Sambodhi Field Coordinator - 2 (TBD)	Field Coordinator	Graduation Degree **Experience:** 10+ Years	• Recruitment and training of field team • Field work planning and resource planning • Field management and supervision of data collection process. • Pan India experience on data collection.
18.	Locals - 12 (TBD)	Field Supervisor	Graduation Degree **Experience:** 5+ Years	• Management and Supervising of data collection activities, • Planning and resource allocation for data collection • Logistic management and Quality control and risk Management
19.	Locals - 36 (TBD)	Field Investigators	Graduation Degree **Experience:** 5+ Years	• Qualitative data collection • Households interviews
20.	Locals - 6 (TBD)	Lister Supervisor	Graduation Degree **Experience:** 5+ Years	• Supervising in the process of Listing activities
21.	Locals - 36 (TBD)	Lister Investigators	Graduation Degree **Experience:** 5+ Years	• Listing activities
22.	Research Associates - 12 (TBD)	Research Associates	Graduation Degree **Experience:** 3+ Years	• Qualitative data collection. • FGDS, IDIs and KIIs

8. Annexure

TABLE 22:POCRA PROJECT COMPONENTS AND ACTIVITIES

PoCRA Project Components, Subcomponents and Activities	
A - Promoting Climate Resilient Agriculture Systems	
	A.1 Participatory development of mini watershed plans
	1. Preparation of cluster level plans
	2. Mobilization of farmer communities
	A.2 Climate smart agriculture and resilient farming systems
	1. Demo. of climate resilient agronomic (CRA) practices – FFS
	2. Enhancement in Carbon Sequestration
	3. Improvement of saline and sodic lands
	4. Protected Cultivation
	A.3 Promoting an efficient and sustainable use of water for agriculture
	1. Catchment treatment
	2. Drainage Line Treatment
	3. Construction of new water harvesting structures
	4. Rejuvenation by desilting/repairs of old water harvesting structures
	5. Construction of groundwater recharge structures
	6. On-farm water security(Compartment /graded bunding)
	7. Micro irrigation systems
	8. Protective Irrigation
B - Post Harvest Management and Value Chain Promotion	
	B.1 Promoting Farmer Producer companies
	1. Resource Agency Cost for support to existing FIGs/FPOs/FPCs
	2. Establishment of Custom Hiring Centres
	B.2 Strengthening Emerging value chains
	1. Support to FIGs/FPOs/FPCs for product aggregation, handling, transformation & marketing
	B.3 Improving the Performance of Seed Supply Chain
	1. Production of foundation & certified seed of climate resilient varieties
	2. Development of seed hub-infrastructure support
C - Institutional Development, Knowledge and Policies	
	1. Updation of SREPs aligned to Climate Resilient Agriculture
	2. Agro-met advisory services
	3. Preparation and Updation of contingency plans
	4. Preparation of Long term climate change models
	5. Risk Analysis Framework
	6. Maharashtra Climate Innovation Centre
	7. Analytical studies pertaining to climate resilience
	8. Agricultural Innovations - demonstrations/ testing/consolidation
	9. Strategic Partnership with other institutes
	10. Capacity Development
	11. MIS and ICT
	12. Information, Education and Communication (IEC)
D- Project Management	

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