



ADAPTATION FUND

REQUEST FOR PROJECT/PROGRAMME FUNDING FROM THE ADAPTATION FUND

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project/programme must be fully prepared (i.e., fully appraised for feasibility) when the request is submitted. The final project/programme document resulting from the appraisal process should be attached to this request for funding.

Complete documentation should be sent to:

The Adaptation Fund Board Secretariat
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Washington, D.C., 20433
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ADAPTATION FUND

PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

PART I: PROJECT/PROGRAMME INFORMATION

Project/Programme Category:	REGULAR (CONCEPT PAPER)
Country/ies:	INDIA
Title of Project/Programme:	ENHANCING ADAPTIVE CAPACITY AND INCREASING RESILIENCE OF SMALL AND MARGINAL FARMERS IN PURULIA AND BANKURA DISTRICTS OF WEST BENGAL
Type of Implementing Entity:	NIE
Implementing Entity:	NATIONAL BANK FOR AGRICULTURE AND RURAL DEVELOPMENT (NABARD)
Executing Entity/ies:	Development Research Communication and Services Centre (DRCSC)
Amount of Financing Requested:	US \$ 25,33,533 (in U.S Dollars Equivalent)

Project / Programme Background and Context:

Provide brief information on the problem the proposed project/programme is aiming to solve. Outline the economic social, development and environmental context in which the project would operate.

West Bengal is an eastern state of India. The Net State Domestic Product (NSDP) of West Bengal in respect of the climate dependent sectors (agriculture including animal husbandry and horticulture, forestry and fisheries) for the year 2008-09 was 22.11% of the total NSDP at Constant 1999-00 Prices, and together constituted a quarter of the total NSDP of the state of West Bengal. Further, 70% of its total population, mainly the rural population, were dependent on these climate sensitive sectors for their livelihood.. Of the total rural workers, 19.53% and 19.30% were cultivators and agricultural laborers, respectively. According to the Planning Commission, 31.85% of the total population lived below poverty line in 1999-2000 in the state of West Bengal.

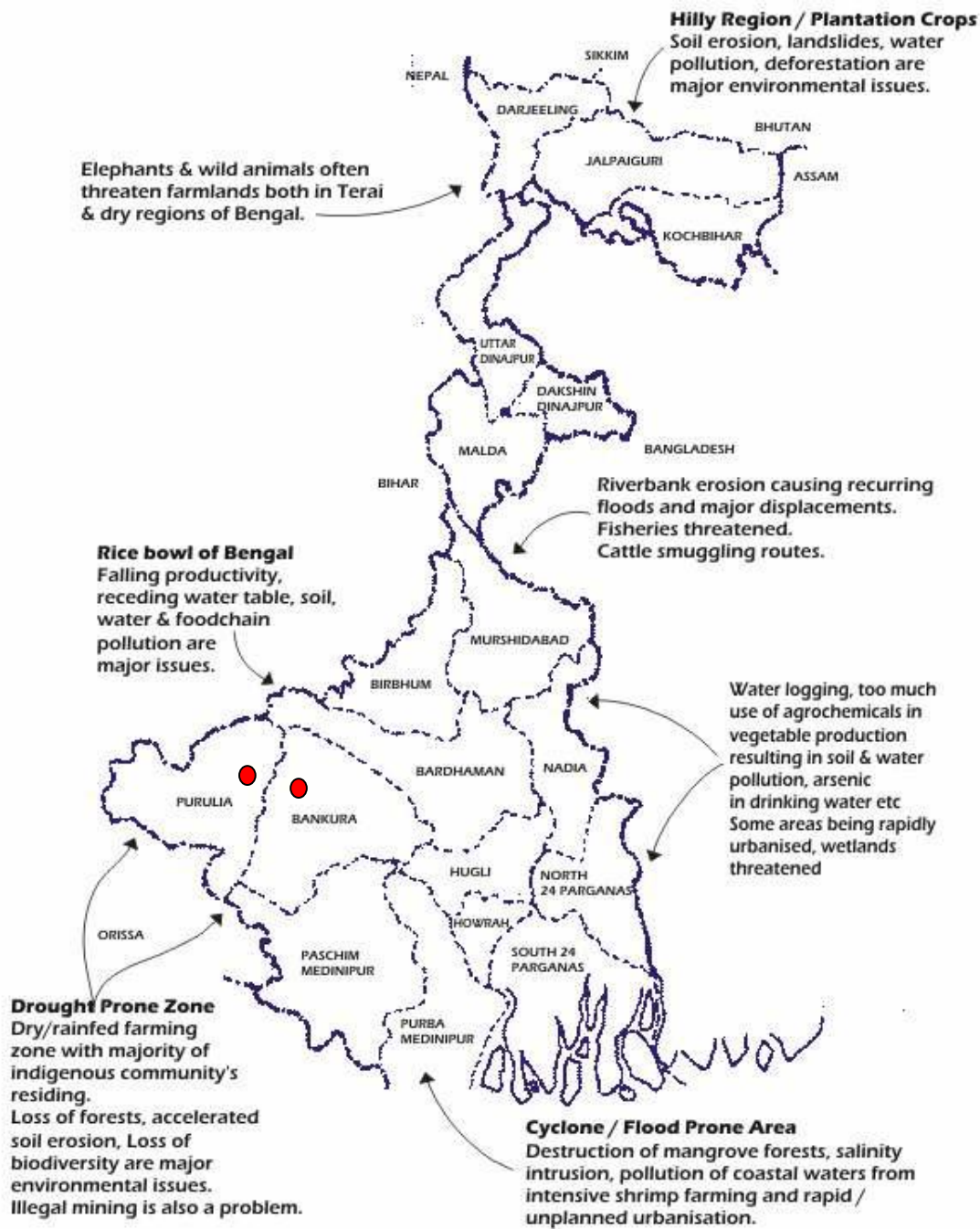
Covering just 2.7% of the Indian landmass, it is home to 12.27% of both floral and fauna biodiversity known till date. The state has more than 7000 species of described flora including bacteria, algae, fungi, bryophytes, pteridophytes and angiosperms and more than 10,000 species of described fauna.

West Bengal is also a multi-hazard state with the following agro-ecological zones:

- Hill region covering the districts of Darjeeling, Coochbehar and Jalpaiguri

- Old Alluvial Zone comprising of North Dinajpore, South Dinajpore and Malda
- New Alluvial Zone covering Murshidabad, Nadia, parts of North 24 Parganas, Hooghly and Bardhaman
- Red and Laterite zone covering the districts of Birbhum, Bankura, Purulia, West Medinipur;
- Saline Coastal region: Covering East Medinipur, Hooghly, parts of North 24 Parganas, South 24 Parganas, Kolkata

Each of the zones has its own ecological vulnerability (see map below).



The multi-hazard events and loss of GDP due to climatic hazards demonstrate that almost the entire state is significantly impacted by at least one hazard and its related vulnerability. Intensification of these instantiations or slow onset disasters like water scarcity, drought, water logging, floods, saline water intrusion and cyclones is one of the predictable impacts of climate change and climate instability in future. Lack of availability and access to technological and financial resources coupled with a high dependence on climate sensitive sectors like agriculture, fisheries, forestry, have made West Bengal highly vulnerable to climate change. The project wants to focus on the districts of Bankura and Purulia to strengthen the capacity of small and marginal farmers to build resilient livelihood models in line with SAPCC of West Bengal.

BRIEF CLIMATIC-ECOLOGICAL VULNERABILITIES IN RED LATERITIC ZONE¹

The 'Western Tract' of West Bengal broadly lying between 21° 47' N- 24° 15' N latitude and 85°49' W - 88° 2' East longitude covering 99 blocks in 13 sub-divisions of Purulia, Bankura, Birbhum, entire Paschim Medinipur and occupying 28,379 sq.km. or 31.98 percent of the total area is identified as the 'drought prone' undeveloped area of the state. A close examination of per capita income, persons / families living below poverty level, productivity, cropping intensity, seasonal/permanent fallow etc. indicate that the area is undoubtedly undeveloped. The disadvantaged physical environment, particularly weather and climate, topography and soil are the main factors responsible for the backwardness of this area.

Average annual rainfall is 1446.4 mm which varies from 1218.8 mm at Burrabazar in Purulia to 1704.0 mm at Pingla in Paschim Medinipur. Within 13 sub-divisions, the amount varies from 1316.3 mm at Purulia Sadar to 1636.0 mm at Kharagpur and the number of rainy days varies from 68 to 79. So, regarding the amount of rainfall and number of rainy days this region is not far behind many other regions / districts of the State. Coefficient of variability of rainfall is also around 16% which is not a very high figure. This region receives 75-80 per cent of the total annual rainfall during the four monsoon months i.e. between June and September. During other seasons, the proportion is 3 per cent during winter (December - February), 8 - 12 per cent during hot weather period (March - May), and 8 - 9 per cent during the period of retreating monsoon (October - November).By virtue of its continental or interior location the western tract experiences a relatively dry and extreme weather condition compared to other parts of the State. This extremity is manifested by larger diurnal as well as annual range of temperature, low relative humidity etc.

Topographically the region is a part of Chotonagpur Plateau fringe and gradually rises from east to west. The terrain is undulating in character and dotted with residual hillocks or small hilly blocks, the largest and highest among these are Ajodhya Hills the highest point of which is located at 677 m. Towards east and south east it gradually merges with the Ganga plain. Thirty and fifty meters contour may be considered as the limit of the region towards southeast and east respectively. This landmass has been dissected by a number of streams flowing from the west to east following the general slope of the land. Red and lateritic soil dominates the landscape and gradually merges with old alluvium towards east. Gravelly soils are also found in patches in the vicinity of the hills. In general the soils are thin, coarse grained, poor in organic matter and very poor in water holding capacity.

¹ Policy brief for western tract: Dr. Swadesh Mishra, Ex-Agricultural Meteorologist & Rainfall Registration Authority of West Bengal

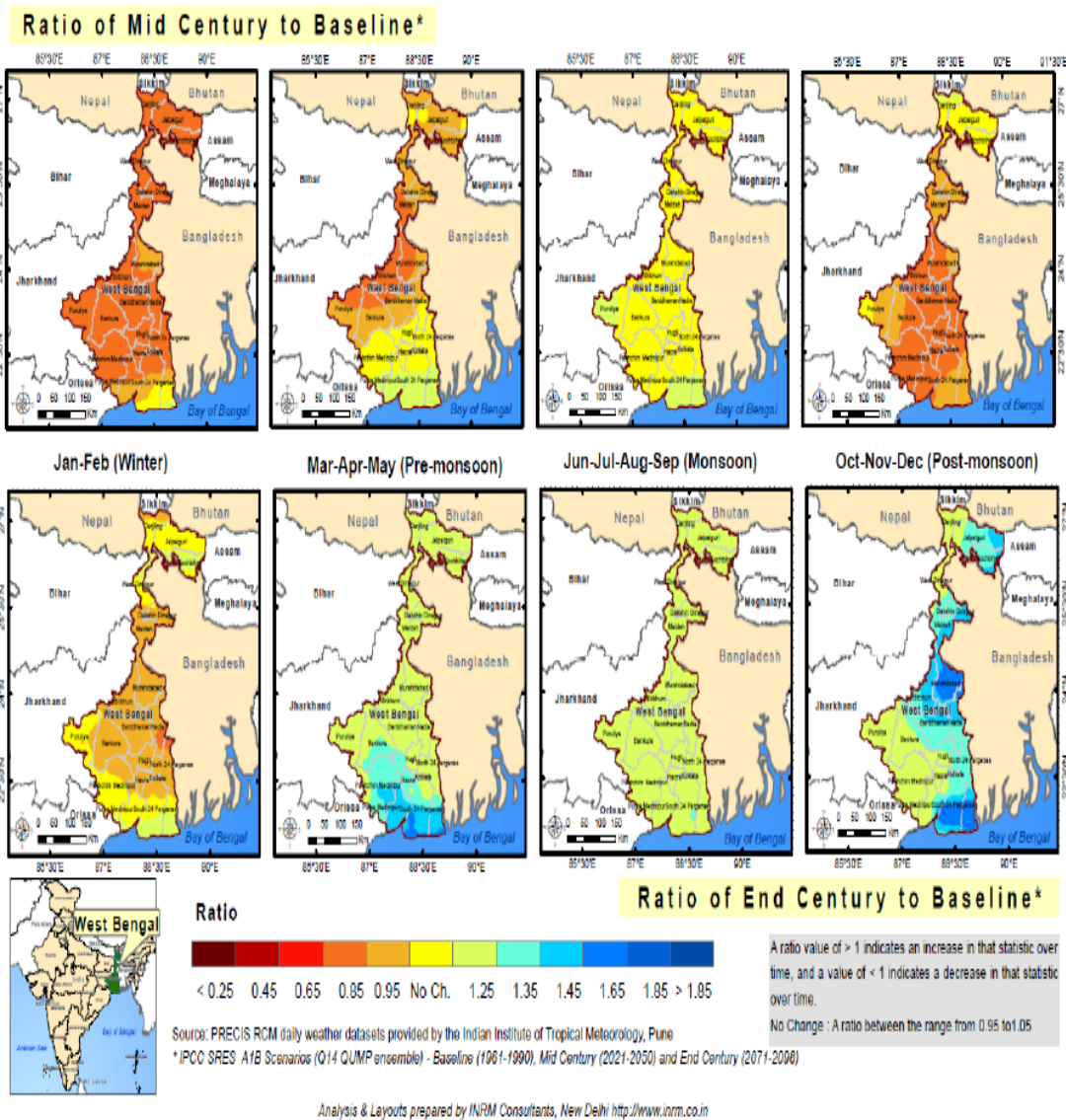
THE OBSERVED CLIMATIC CHANGES WITH FOCUS ON LATERITIC ZONE²

Temperature: *It is observed that,* the maximum temperatures are decreasing across the state whereas the minimum temperatures are increasing. The maximum temperature has become less by 0.5°C with respect to starting of the observation period (1970s) in the Lateritic zone. Whereas, the minimum temperatures are increasing all across the state. In the lateritic zone, the minimum temperature has increased by 0.5°C.

Precipitation: A recent report of the IMD indicates that there have been distinctive changes in observed pattern of rainfall between 1901 and 2003 between the northern and southern regions of West Bengal. In winter and pre-monsoon seasons, rainfall has decreased in the southern region by -14.5 mm and -6.7 mm respectively. In the northern region an increase in rainfall in the pre-monsoon season by +10.5 mm has been observed during the same period, whereas a decrease in rainfall by -1.7 mm in the winter season has been observed over the same period. In the monsoon season the increase in rainfall in the southern region is about 91 mm and in the southern region the increase is around 57 mm. Post monsoon season continues to show an increase in rainfall by 25 mm in southern region, but a decrease in rainfall is observed in the northern region (-5mm). In the monsoon period, the same analysis carried over for 1901-2003 indicates that the June rainfall has decreased by an amount of -3.1% in northern part of Bengal and by -0.9% in the southern part of Bengal. There is no change observed in the July precipitation in the southern region, but in July there is a perceptible increase in rainfall by 4.5% in the northern region. In August there is an overall decrease by -0.2% and -0.1% in southern and northern parts of West Bengal respectively. In September, though southern West Bengal shows an increasing trend (+2.5%), the northern part of Bengal shows a decrease in rain fall by -1.1%. An analysis of total annual rain fall for a recent time slice, between 1990 and 2008, for the 6 agro climatic zones in West Bengal, carried out using the rainfall statistics published in the district handbooks, indicates that there is an overall decrease in the total rain in 2008 with respect to 1990 in the Red and Laterite zone.

Onset of monsoon: Analysis of the dates of onset of monsoon for a period of last 102 years over Gangetic West Bengal reveals that the mean date of onset of monsoon over this region now stands on 13th June (previously it was 7th June). However, there has not been any substantial change in the date of withdrawal of monsoon. These observations, therefore, clearly indicate a gradual reduction in the span of monsoon over this region.

² SAPCC West Bengal, Status of climate in India by IMD, Reports from School of Oceanographic Studies



As per the climate change projections given above the rainfall is likely to increase in the eastern parts of Purulia, during monsoon period in the middle of the century, but other parts of this region are likely to experience no change with respect to 1970s.

There is however, a distinct decrease in rainfall in the non-monsoon periods, with no change indicated for the eastern part of Purulia during Oct-Nov period. The net changes in annual blue water flow also show a decrease in the mid-century with respect to 1970s in this region. The green water storage, i.e the soil water is decreasing in the mid-century with respect to 1970s. [Source : SAPCC West Bengal]

Storms and depression: An analysis of the frequency of storms and depressions in the area within 80 E - 95 E and 10 N - 27 N for a period of 80 years (1891 - 1970) shows an increasing trend averaging about 1.6 storms per annum. This is partially responsible for the increasing

trend in rainfall over the coastal as well as western tract. The frequency of storms and depressions has further increased thereafter.

Drought-proneness: A study of drought for a period of 100 years (1901- 2000) indicates that the Gangetic West Bengal experienced the phenomena for 7 years during the first 50years period but the frequency increased by 12% during the second half of the last century.

In conclusion,

- Deposition of dew is decreasing.
- Erratic nature in weather behavior is increasing.
- Typical seasonal character of weather is disappearing.
- Exceptional incidences are becoming the usual ones.
- Winter is becoming brief and mild with frequent warm spells in between.
- Summer is becoming longer.
- Variability of monsoon rain is on the rise with increasing incidences of partial break in one region and heavy rainfall in the other, causing partial droughts and floods.
- Post-monsoon weather is becoming too uncertain and variable.

Observed and projected changes in Climate in West Bengal

- Between 1969-2005 a net warming trend has been established in the annual average temperature.
- Minimal decrease in maximum temperatures of the order of -0.25 to -0.50°C in the entire 37 year period.
- Perceptible increase in minimum temperatures have been observed which ranges between +0.25 to +1.50°C within the same period
- The total amount of monsoon rainfall, which accounts for more than 75% of total annual rainfall over the state, has not changed significantly between 1969-2005.
- Tough high variability in inter-annual rainfall in time and space has been observed
- A clear positive trend in post monsoon (Oct-Nov-Dec) rainfall in almost all over the state has been observed during 1969-2005
- The intensity of extreme rain fall events has increased in West Bengal as concluded by the IMD

Projected changes in 2021-2050 with respect to base line simulation for 1961-1990

- A likely increase in temperature between 1.8 to 2.40°C.
- Total amount of precipitation during monsoon, is not likely to change with respect to base line scenario in most parts of West Bengal.
- The winter and summer seasons likely to experience lower rainfall with respect to base line.

According to the SAPCC, this region already suffers from recurrent droughts, and the ground water potential as it is not very high in comparison to other regions of the state. Policies that augment the storage of surface run off need to be boosted here. Some of the adaptation strategies that can be instituted are as follows:

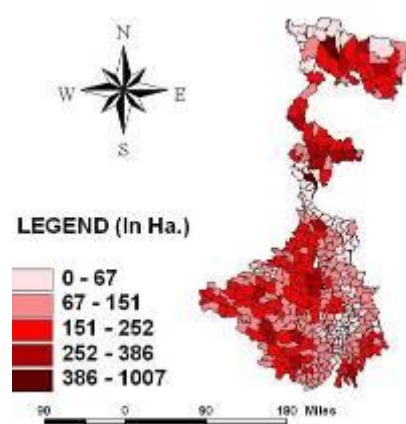
- Undertake special afforestation programmes to increase the run off infiltration ratio through joint forest management practices in identified regions
- Undertake extensive rain water harvesting through dug up pits or directing rain water to the recharge zones in the undulating slopes of the hills to increase the percolation of rain water and thus result in the recharge of ground water, reduce sediment load, and rejuvenate moribund rivers. Create small reservoir schemes such as check dams, that intercept rivulets, Nalas, with canal system in this region.
- Encourage surface water schemes, through rain water conservation in ponds/dighis as hard rocks in the area do not provide access to deep aquifers which are free from fluoride.

ASSOCIATED IMPACT AND VULNERABILITIES WITH FOCUS ON LATERITIC ZONE³

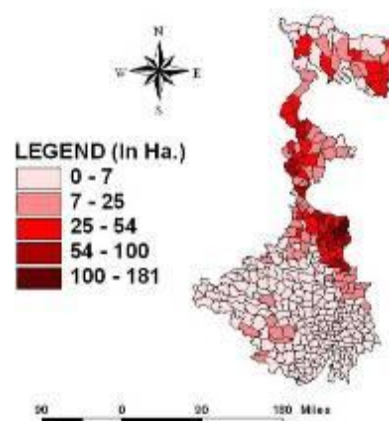
Agriculture: Agriculture remains the primary occupation of the vast majority of the population in the flood plains. *Aman* rice (Monsoon Paddy), one of the major crops in the state, is particularly vulnerable to flooding. The map below shows that majority of the *aman* rice growing areas lies

³ SAPCC West Bengal, Status of climate in India by IMD, Reports from School of Oceanographic Studies

in the flood plain regions of the state. The same areas incidentally also have the largest concentration of cultivators.



Area under Aman Rice.



Area under Wheat

Most studies that have considered the impact of climate change on crop performances indicate that *Rabi* (winter) crops would suffer most from temperature increases. Wheat and potato are two major winter crops for West Bengal. Wheat is cultivated across 363200 ha, mostly alluvial and part of lateritic zone. Apart from the vulnerability of these crops to rising winter minimum temperature, areas under these crops also lie in the flood prone areas and are hence vulnerable to flooding also, as the monsoon in these two districts moving more towards winter – which will be the weaning period of these crops. The decreasing trend of winter rainfall contributes to increasing vulnerability in the absence of expansion of irrigation.

Specifically in **lateritic zone**, 3/4th of the annual rainfall comes from the South-West monsoons that occur between June and September – and the major crops like rice, maize and some other millet are sown during this season. So anomalies and unpredictability of monsoon has also lead to moderate to severe water scarcity. The immediate consequence of drought/water scarcity is predictable which is decline in agricultural production and income. But this ignites an ominous chain of events - indebtedness, distress sales, asset depletion, and deteriorating health - all of which perpetuate poverty and deprivation.

Some impacts predicted by the scientists⁴ may be summarized as follows:

- Productivity of temperature-sensitive crops, especially Rabi crop is decreasing.
- Water scarcity is increasing.
- Incidences of pests and diseases are increasing.
- Problem of weeds is increasing.
- Fertility of soil is being eroded faster.
- Decomposition of organic material and fertilizer are becoming faster.
- Incidences of crop failure is increasing.

⁴ Policy brief for western tract: Dr. Swadesh Mishra, Ex-Agricultural Meteorologist & Rainfall Registration Authority of West Bengal

- Length of growing season of pre-kharif and kharif crops is increasing at the cost of the Rabi season.
- Decomposition of roots is being noticed.

Farming is still the most common livelihood option in the state of West Bengal. Among the farming community, the percentage of landless household is 35%, 43% have less than an acre of land. This 78% farming community household holds only 20% of the total cultivatable land. Small and fragmented land holding pattern by majority of farmers made them vulnerable to climate change.

COMMUNITY PERSPECTIVE OF CLIMATE CHANGE AND ASSOCIATED VULNERABILITY⁵

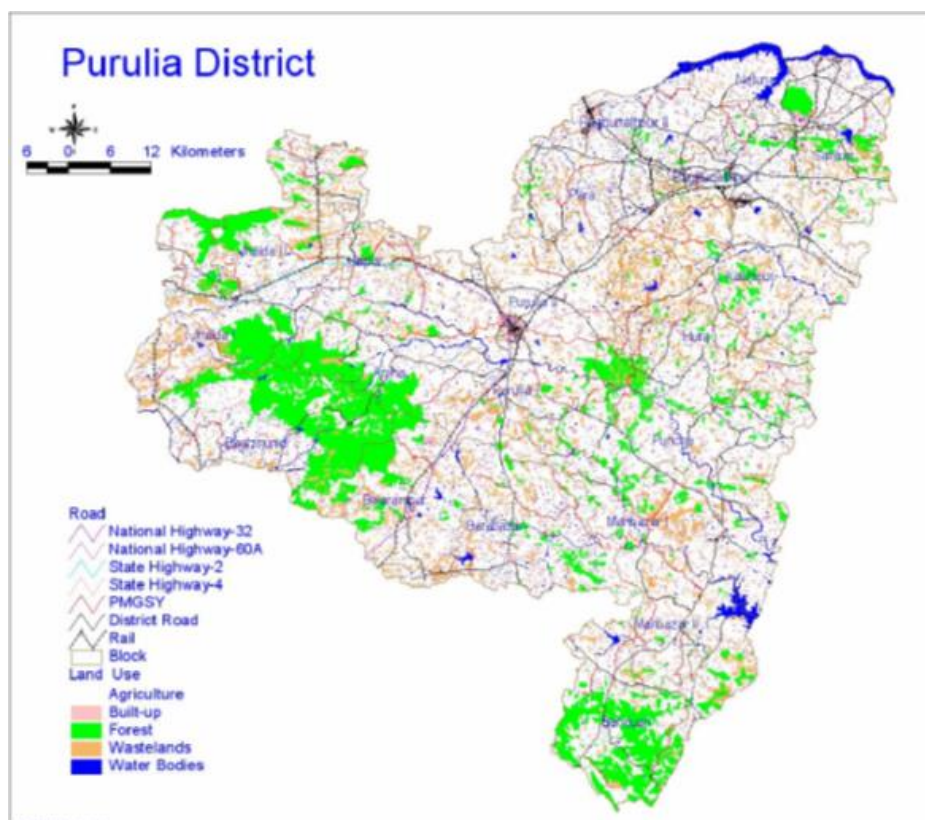
Based on the PRA conducted by DRWC the following areas of concerns relating to climate change have been identified.

- Rainfall is inherently scanty and is declining further, especially during last 5-6 years.
- Temperature, both maximum and minimum, is rising.
- Agriculture is mainly rain fed. Soil is poor in nutrient content.
- The forest cover is vanishing gradually. The collected food items are no longer grown in the forest. This zone is dominated by tribals, who are generally more dependent on non timber forest products (NTFP).
- Lack of fodder and degradation of grazing land .
- Wells are getting dried quickly during summer.

BACKGROUND OF THE FOCUSED DISTRICTS

PURULIA: This district is between 22°42'35" and 23°42'0" north latitude and 85°49'25" and 86°54'37" east longitude. Midnapore, Bankura and Burdwan district of West Bengal and Dhanbad, Bokaro, Hazaribagh, Ranchi, West Singhbhum, East Singhbhum district of Jharkhand State bound this district. Out of the 2468 rural inhabited mouzas of this district, 994 mouzas have been declared as backward i.e. 40.28 % of the inhabited mouzas are backward.

⁵ PRA, conducted by DRCSC



Climate: Purulia is a drought prone district. The district has a sub-tropical climate and is characterized by high evaporation and low precipitation. Temperature is very high in summer and low in winter – it varies from 3.8°C in winter to 52°C in summer, causing dryness in moisture. Average annual rainfall varies between 1100 and 1500 mm. But uneven, scanty and erratic rainfall results in drought in the kharif season.

Drainage: The main rivers passing through or bordering the district are Kangsabati, Kumari, Darakeswar, Subarnarekha and Damodar. Soil erosion is the most prominent phenomenon of this district resulting huge deposition of fertile soil in the valley region. As a result, Purulia District is facing crisis due to depletion of top fertile soil and water loss.

Available Resources:

Forest : As per Satellite Imagery data 52.47 % of total Geo area is used for agriculture. 29.69 % are under forest coverage (including social forestry) and 10.15 % are identified as Wasteland (14.11 % as per Landsat Thematic Mapper/IRS LISS II/III data). The natural forests of the district are mostly of mixed nature.

Ground Water: The district is a 'White Zone' in respect of ground water status (i.e. 60% of available ground annual recharge is in use). In general, during the rainy season the water table in the wells raises up to 1.00 to 3.50 m below ground level (bgl) till the end of October and gradually falls down to maximum of 6 to 14 m bgl during April-May.

Agriculture: The percentage of net-cropped area to cultivable area is 73.35%. Only 16.53 % of the net-cropped area is under multi crop cultivation. 90% of the net-cropped area is under Aman paddy cultivation Cropping Intensity is 117%. About 60 % of the total cultivated land is upland. On the other hand out of the total operational holding, 72.68 % belongs to small and marginal farmers (92 % of the total no. of holding) having scattered and fragmented small holdings.

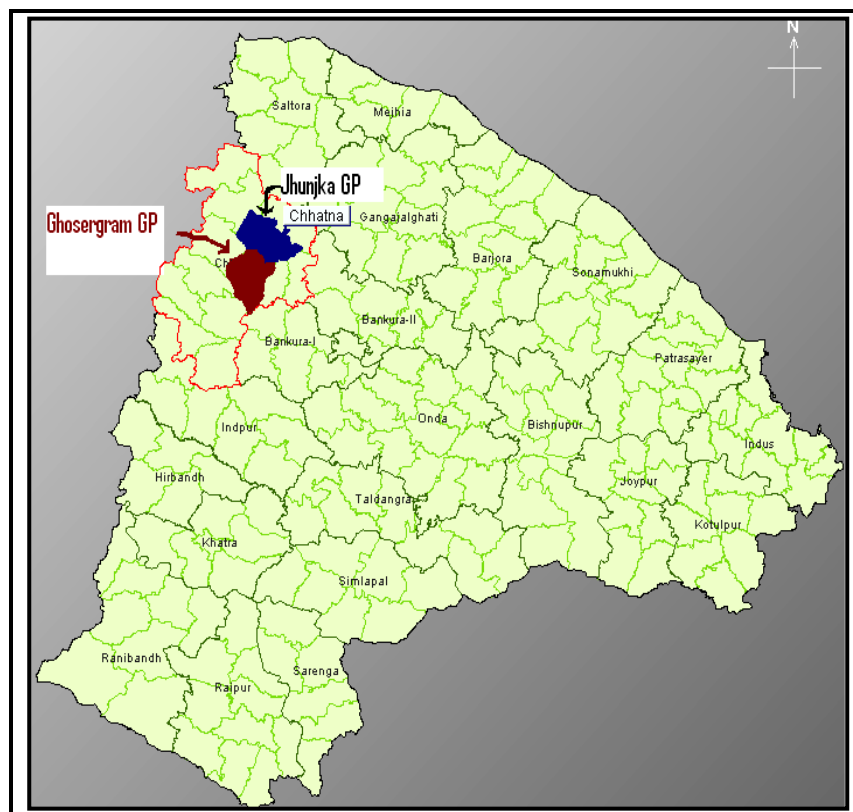
Irrigation: As per Minor irrigation Census 2001, 17.09 % (Considering gross cropped area as 391390 hectare) of the gross cropped area is under irrigation. Contribution of Surface Flow irrigation source is 88.83%. Out of the total gross irrigated area 74.86 % irrigated in Kharif and 21.19% in Rabi. As per Minor Irrigation census 2001 total nos. of Tanks in this district are 26491. Out of which, Tanks used for irrigation purpose are 18426 nos. and Tanks used for non-irrigation purpose are 8065 nos. There is altogether 32 Nos. of medium irrigation Schemes in this district. Out of these 32 Schemes, 23 are completed and 9 are in various stages of execution. Few new schemes are yet to be executed. There are altogether 135 River Lift Irrigation (RLI) schemes with effective command area. The total irrigation potential created is 13500 acres. There is altogether 66 surface flow Minor Irrigation Schemes. The total Irrigation Potential created are 8193ha. Out of which 6498 ha in kharif and 1595 ha in Rabi-Summer. No. of Dug-well constructed so far are 4218 nos.

Animal resources: As per 17 Live Stock Census the total population of Cattle is 826000 and that of buffaloes is 131385. Total fowls available in the district are 1601373. Share of crossbred cattle is only 1.55%. Bovine density per sq. Km. is 157. Per capita availability of milk per day in this district is 51.40 gm and per capita availability of meat per year is 5.70 Kg and per capita availability of Egg per year is 29.91 nos.

Fishery: Total water area available in this district is 18575.69 hectare, which includes big and seasonal tanks and ponds. Besides that there are 36 nos. of big and medium sizes of Dams and Reservoirs, which covers about 8557.74 hectare of water area. 16214-hectare (87.29% of the net area) water area comes under the effective pisciculture. The annual production is approximately 250630 Qtls.

BANKURA

Bankura is situated between 22° 38' and 23° 38' north latitude and between 86° 36' and 87° 46' east longitude. It has an area of 6,788 km². In the north and north-east the district borders with Bardhaman district, from which it is separated by the Damodar River. In the south-east it borders with Hooghly district, in the south with Paschim Medinipur district and in the west with Purulia district.



Bankura and the selected GP:

Bankura district has been described as the “connecting link between the plains of Bengal on the east and Chotanagpur plateau on the west”. The areas to the east and north-east are low lying alluvial plains, similar to predominating rice lands of Bengal. To the west the surface gradually rises, giving way to undulating topography, interspersed with rocky hillocks. Much of the country is covered with jungles. The area consists of two different tracts. The western part marks the gradual descent from the table land of Chota Nagpur to the delta of lower Bengal, consisting largely of spurs projecting from the western tableland and of low swelling ridges. However, there is no marked ridge of hills. The rolling downs of the central part gradually merge with the alluvial plains.

The western part of the district has poor, ferruginous soil and hard beds of laterite with scrub jungles and sal (*Shorea robusta*) woods. Long broken ridges with irregular patches of more recent alluvium show signs of seasonal cultivation. During the long dry season large areas of red soil with hardly any trees lend the country a scorched and dreary appearance. In the eastern part there are wide expanses of rice fields, green in the rains but parched and dry in summer.

Hills: The hills of the district consist of outliers of the Chotanagpur plateau and only two are of any great height – Biharinath and Susunia. While the former rises to a height of 448 metres (1470 ft.), the latter attains a height of 440 metres (1440 ft.). There are a number of other low hills also.

Rivers: The rivers of the area flow from the north-east to the south-west in roughly parallel courses. They are mostly hill streams, originating from the hills in the west. The rivers come down in floods after heavy rains and subside as rapidly as they rise. In summer, their sand beds are almost always dry. Damodar River forms the northern boundary of the district with Bardhaman district for about 72km and then flows into Bardhaman district. Floods in the Damodar rarely do much damage to the district. Sali River which drains the northern part of the district is an important tributary of the Damodar. Amongst the other rivers flowing through the district, the most important is Dwarakeswar River. It has many branches or old beds in the area of Onda and Bishnupur. Other major rivers are Shilabati River and Kangsabati River, both of which enter the district from Purulia district, run along a short course in the territory and then enter Paschim Medinipur district.

Geology: The greater portion of the district consists of a rolling topography covered by laterite and alluvium. This region is primarily undulated with mounds and valleys and exhibits different grades of laterisation process in its soil formation. Soils are well drained, susceptible to soil erosion due to rapid external drainage or run off, soil reaction ranges from acidic in ridges and near neutral in valleys. Organic carbon content, phosphate and patas are low. Agriculture in this region is mostly rain depended. Ground water is not easily and economically tapeable. Prevalence of moisture stress on standing Kharif Crop in late monsoon period is very common.

Climate: The climate, especially in the upland tracts to the west, is much drier than in eastern or southern Bengal. From the beginning of March to early June, when the monsoon sets in, hot westerly winds prevail, the thermometer in the shade rising to around 45 °C. The westerly winds die down around sunset and allow cool winds to blow from the south. North-west winds are frequent during this period and help to mitigate the excessive heat. The monsoon months, June to September, are comparatively pleasant, as the weather is not as sultry as in other parts of Bengal. The total average rainfall is 1100 to 1400 mm, the bulk of the rain coming in the months of June to September. Winters are pleasant with temperatures sometimes dropping down to below 10°C in December.

Agriculture: Net cultivable area of the District is 4.30 lakh ha and number of cultivator is 4.47 lakh and availability of net shown area per cultivator works out to 1.02 ha. Due to continuous division and fragmentation of cultivated land, agriculture is becoming less remunerative. About 46% of the net cropped area is under Irrigation. The gross cropped area is about 6 lakh ha. and cropping intensity is 147%. Rice, Wheat, Oil seeds and Vegetables are the Principal Crop occupying major of the gross cropped area. Most of the Pre-Kharif and Kharif rice are grown in rain-fed condition. HYV crops occupied about 9% in this district considering 100% in summer rice. Wheat is second most important cereal crop in the district and crop is cultivated in assured / limited irrigated areas. Among different Oil seeds, Rape & Mustard, and Sesamum are two important oil seeds grown in this district Sesame is cultivated in 3 seasons while Rape & Mustard is cultivated during Rabi season. It is paradoxical that though Bankura lies in sub-humid zone having total Annual Rainfall of 1100 mm to 1400 mm. Agriculture is largely dependent on the vagaries of monsoon. Drought constitutes a major hazard in the district. Intermittent gaps in precipitation and moisture stress during the monsoon gives rise to serious setback in production during the Kharif, which is the main stay of Agriculture in the district.

CURRENT WEATHER INFORMATION DISSEMINATION SYSTEM⁶

At present, there is no separate and independent communication network for Disaster Management in the state. After renaming and reorganization of the Department of Relief as Department of Disaster management, the prevailing and conventional communication network is being used along with other State Government Departments. Existing communication network systems are PSTN, Cellular Network & Broad-Band network from State level to Gram Panchayat level. VSAT network system is available from State Government level to Central Government. At present the existing system of receiving and conveying the weather information including cyclone warning system and other natural hazard reports are originated from the Indian Meteorological Department (IMD) and then it is conveyed simultaneously to State Disaster Management Department, concerning District and Zilla Parishad authorities and to the AIR & electronic (TV channels) and non-electronic media (newspaper). Existing communication network systems are being used for this whole activity. The Government administration and media depend on the existing telecommunication network. The population of the affected areas is dependent only on radio & TV broadcast.

The summary of responses received from the community on this aspect during stakeholder consultation are as follows:

- Usually the information comes through radio (announcement system) by Panchayat, newspaper and television. It is about rainfall, water level and storm.
- There is no system of dissemination of local weather information based on data at Block or Gram Panchayat level
- Similarly, dissemination of crop-weather information and advisories are absent
- There is no information provided on weather/climate risk and adaption options on major livelihoods; like agriculture, livestock, fisheries etc.

IN CONCLUSION

Issues which affect livelihood of small and marginal farmers	Economic Impact	Impact on Ecosystem	Social Impact	Impact on Development
Water availability	Falling of production and productivity due to water scarcity and water logging, lack of water for livestock and poultry.	Loss of Biodiversity, Falling Ground water	Inequitable distribution of irrigation water. Land becomes unproductive leading towards poverty. Increasing drudgery of women for bringing water.	Lack of drinking water and water for household use and home garden, Water borne diseases in waterlogged area.
Disaster/Shock	Falling of	Pest and	Migration,	Food and nutrition

⁶ Disaster management plan, Government of West Bengal and PRA done by DRCSC

Issues which affect livelihood of small and marginal farmers	Economic Impact	Impact on Ecosystem	Social Impact	Impact on Development
	production and productivity. Loss of land due to salinity, erosion.	disease attack, loss of agro biodiversity.	increasing scarcity of food, fodder, firewood and cash.	insecurity, malnutrition.
Decreasing Natural Resources	Loss of NTFP based livelihood, lack of fodder	Low productivity, Loss of buffer. Loss of diversity, depletion of ground water.	Migration of landless.	Nutrition insecurity especially during stressed period..
Climatic pattern	Uncertainty in production.	Loss of biodiversity, Pest and disease attack on crops and livestock.	More stress to women for livelihood related work.	More investment on relief rather than development.

Proposed Location and Beneficiaries

The project will focus 5000 households covering about 26,350 beneficiaries who belong to vulnerable small and marginal farming communities and communities dependent on natural resources as livelihood option. The geographical focus will be 40 villages from Kashipur block of Purulia and Chhatna block of Bankura district

Project / Programme Objectives:

List the main objectives of the project/programme.

Overall goal

Developing climate adaptive and resilient livelihood systems through diversification, technology adoption and natural resource management for rural small and marginal farmers associated with agriculture and allied sector in Lateritic Zone of West Bengal.

Specific Objectives

To enhance adaptive capacity of vulnerable farm families in semi-arid regions of Purulia and Bankura districts of West Bengal by introducing measures to tide over the adverse impacts of climate change on their food and livelihood security.

Operational Objectives

1. To conduct series of exercises with the stakeholders and analyze climate data/GIS maps to work out community planning exercises for land & water use master plan with the aim of developing protocol for collective management of natural resources.
2. To establish local climate resource centres, linking it with technical institutions and sending crop-weather advisories relevant to the livelihood of small and marginal farmers associated with agriculture and allied sector
3. To develop, demonstrate, document and promote climate resilient livelihood models.

Project / Programme Components and Financing:

Fill in the table presenting the relationships among project components, activities, expected concrete outputs, and the corresponding budgets. If necessary, please refer to the attached instructions for a detailed description of each term.

For the case of a programme, individual components are likely to refer to specific sub-sets of stakeholders, regions and/or sectors that can be addressed through a set of well defined interventions / projects.

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US\$)
1. Land & Water use master plan (LUP & WUMP)	1. LUP & WUMPs are prepared clubbing 2 to 3 contiguous villages together, wherever necessary.	Communities develop protocol for collective management of land and water use through better understanding of climate change related impact	85,824
2. Reducing climate risks through timely and appropriate early warning in local language	1. Weather stations & Climate Resource Centres (CRCs) in 2 locations and weather kiosks in all working villages established for providing crop-weather advisories through SMS 2. Groups of local resource persons (climate volunteers) and local Committee organized for analyzing the data and preparing / disseminating to targeted households.	Farmers and other natural resource dependent communities are better prepared for hazards/climatic vagaries.	20,500 6,667
3. Sustainable Resilient Technology Transfer for enhancing the adaptive capacity of the community	1. Sustainable soil and water conservation measures introduced for improvement of production and productivity. 2 (a) Integrated farms applying sustainable agriculture techniques and practices with low input demanding and high tolerant crops, trees, livestock, backyard poultry, aquatic	Climate risks on livelihoods reduced and annual production stabilized through introduction of natural resource based diversified and integrated alternative production systems.	756,748 907,205

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US\$)
	<p>components popularized</p> <p>2.(b) Disaster-proofing measures like community grain banks, seed banks of local seeds, fodder banks developed in targeted villages</p> <p>3. Appropriate technologies like energy efficient ovens, bio-gas, low cost water filter, community water filter, alternative fuels from waste/weeds, etc. promoted</p>		<p>28,330</p> <p>1,98,415</p>
4. Learning and Knowledge Management	<p>1. At least in 50% cases, plans for WUMPs and LUPs recommended by the Gram Sabha are included in Village Development Plans through convergence of mainstream schemes</p> <p>2. Access of learning outcomes in the targeted villages as well as public domain ensured through film, dedicated website and other printed materials used in farmers' fairs, environment education classes/events in schools targeting direct beneficiary families and indirect beneficiaries as well.</p> <p>3. Networks and partnerships built with NGOs, POs, CBOs, PRIs, local administration, climate activists/experts etc</p>	Awareness regarding climate change and its impacts is improved and climate resilience practices gain popularity in the targeted area	<p>7,868</p> <p>64,166</p> <p>37,500</p>
5. Project / Programme Execution cost			2,21,830
			23,35,053
Project / Programme Cycle Management			1,98,480

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US\$)
Amount of Financing Requested			25,33,533

Projected Calendar:

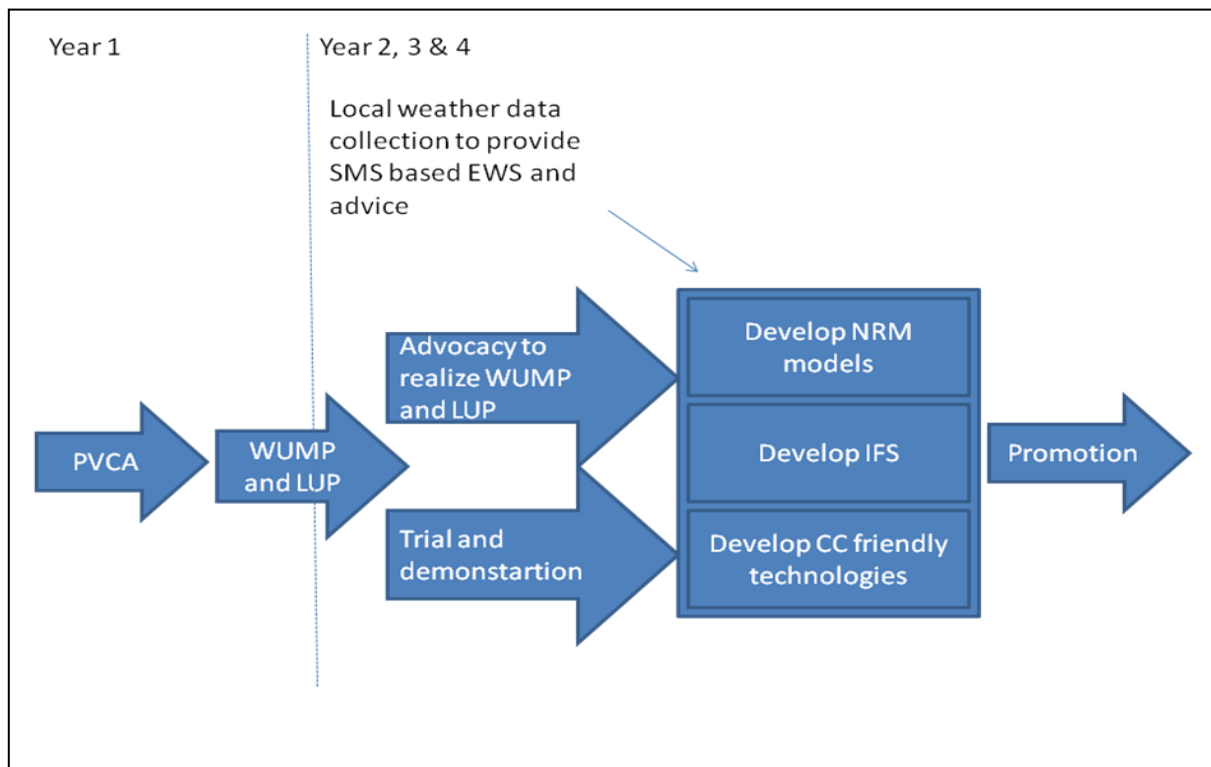
Indicate the dates of the following milestones for the proposed project/programme

Milestones	Expected Dates
Start of Project/Programme Implementation	October 2014
Mid-term Review (if planned)	April 2016
Project/Programme Closing	February 2018
Terminal Evaluation	September 2018

PART II: PROJECT / PROGRAMME JUSTIFICATION

- A. Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

THE OVERALL PROJECT PLAN



Component 1: Preparation of Land & Water use master plan (LUMP & WUMP)

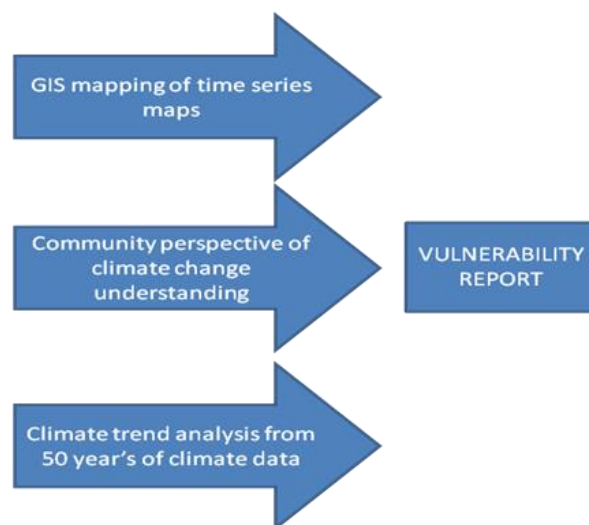
The whole methodology adopted here is categorized into four parts and the whole study will follow the combination of bottom-up & top-down approach and/or the combination of both qualitative and quantitative method. It will consider

a) **GIS mapping of time series maps** of change in ground water scenario, change in land use pattern, change in forest cover, change in the course of rivers, situation of bund etc. to assess the change of trends. This analysis will be done by an expert agency like **school of oceanographic studies, Jadavpur University**. 25 such GIS mapping will be done at the initiation phase of the project.

b) Community Perspective to collect and analyse information about their vulnerability through structured PRA exercise (60 nos) of time line, resource map, problem tree, venn diagram, livelihood analysis and problem ranking, solution matrix, hazard mapping, seasonality diagram etc. Its main purposes are to:

- identify the key vulnerabilities of a particular community
- understand how community members perceive risks and threats to their lives and livelihoods
- analyse the resources (capacities) and strategies available to them to address or reduce these risks.

c) **Climate data analysis** of rainfall, temperature, number of rainy days etc to understand the trend by procuring data from **IMD**.



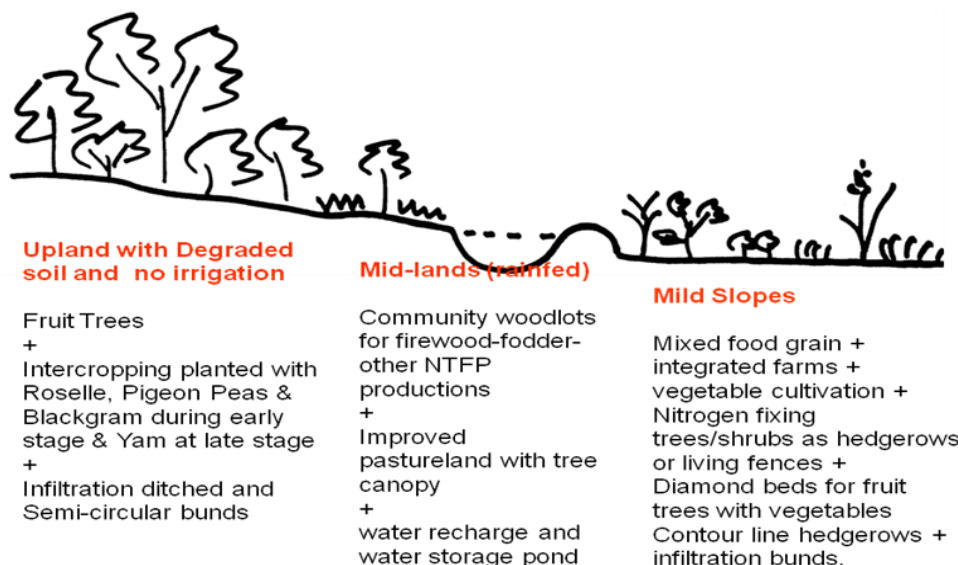
d) **Gram Panchayat level Planning** : LUP and WUMP will be prepared for three Gram Panchayats (GPs). Community perspective and climate data analysis will be carried out during DPR stage making use of Project Formulation Grant (PFG).

PVCA undertaken during the DPR stage will give us the scientific and community perspective of climate related stress on water resources. Water Use Master Plan (WUMP) will be done based on that. WUMP consists of series of PRA exercises for knowing past, present and future water footprint and planning accordingly through

- water resource mapping throughout various season
- water demand mapping for agriculture-animal husbandry and household purpose
- mapping water related problems like how far we need to travel for bringing water etc.

It will help the community to develop an action plan to address identified vulnerability and risk with a future map of proposed bund, water reservoir, soil-water conservation sites, restoration of traditional water harvesting structure etc.

In the **Lateritic zone**, the plan will focus more on water harvesting, planning cropping pattern, water reserve for summer, soil water conservation etc.



Land use Plan (LUP) consists of micro-watershed related exercise with the community with feedback from PVCA, which focus more on common land, water body, grazing land management along with plans like common fisheries, plantation etc. It has more relevance in **Lateritic zone** with the possible generic plan in the left.

Component 2. Reducing climate risks through timely and appropriate early warning in local language

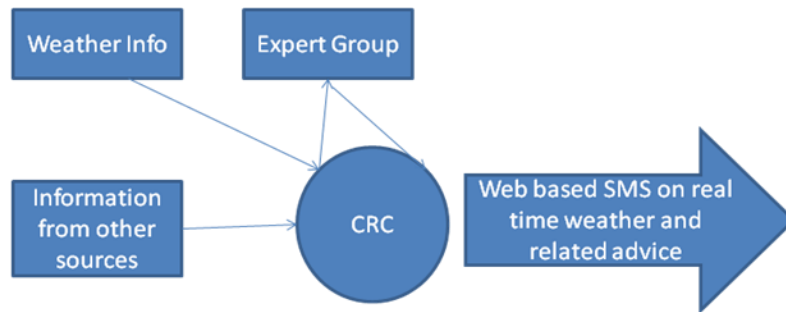
Local Weather station: Local weather stations (2 nos.) will be established to document local weather information including rainfall, maximum-minimum temperature, atmospheric pressure, wind direction and speed, etc. using low cost integrated weather instruments. It may be established in collaboration with a local school so that management, cleaning and regular data keeping can be done by the senior students with supervision of the school. The collected data will be processed at Climate Resource Centre.

Climate Resource Centre (CRC): CRC (2 nos.) will be established in the targeted districts with relevant resources, manuals, AV documents, maps etc – which will help in

- Planning at various levels
- Storing, analyze and provide climate related information and advice specifically relating natural resource management (NRM)
- Storing of weather data and sending it to central location and for analysis by expert group like **Agricultural Universities** for forecasting.
- Web based automated SMS service to the registered persons.
- Access IMD, INCOIS and other websites on a regular basis and sending early warnings.
- Apart from SMS based services, CRC will also have printed and other form of information which are required for planning livelihood, which can also accessed directly.

CRC will be managed by local youth volunteers. The space will be donated by the community – the project will support IEC, ICT and other technical inputs.

The local weather data will be linked to expert groups to generate crop-weather advisories and disseminate through SMS



The impact of climate change manifested in terms of floods, cyclones or droughts is expected to be severe in the coming years. But the coping capacity is weak amongst the rural communities. Provision of weather information and crop advisories can play a crucial role in disaster risk reduction induced by climatic

changes. One of the lessons learned during the recent past is that in spite of the major advances in information and communication technologies, large number of vulnerable people do not receive timely weather information. This was quite evident during the AILA cyclone in 2009.

The weather data that comes to CRC, will be sent to a central location for analysis with support from expert group like **Agricultural Universities** for dissemination. The information will be sent back to CRC again who will translate the information and process web based automated SMS service to the climate volunteers. One KIOSK per three contiguous villages will be established with the facilities for disseminating crop-weather related information to the community by climate volunteers and local committee members.

Why strengthening localized weather/climate information is important to build resilience and how it will improve the present DRM

- It is understood from our earlier studies that, weather information is not sufficient and effective as information is given just before the incident happens, so most of the time the livestock, food stock and crops cannot be saved and the information doesn't reach the interior areas.
- Establish weather stations at high spatial resolution for weather data collection at village level, analysis by nearby Agriculture University and disseminating the same to alert the farming community on weather related risks is very important in helping farmers to make critical farming decisions for efficient crop management practices.
- This will ensure effective outreach for advisory to farmers on various aspects of agriculture including setting up systems to access real time weather and 7 days forecast and long term forecast, forecasting on climate (7days forecast, advent of monsoon and projections on rainfall and temperature for the entire cropping season- on choice of cultivar, time of cropping, likely crop diversification, type, method, time and quantity of farm inputs).

Component 3: Sustainable Resilient Technology Transfer for enhancing the adaptive capacity of the community in *Lateritic Zone*

Soil Water conservation: Initiatives are proposed to check soil erosion to make the soils suitable for cultivation. Measures like contour bunds, check dams, semi-circular bunds, and trenches/pits are being adopted to resist run-off. Multipurpose trees, cover crop and seasonal drought tolerant crops like Roselle, Cowpea, Pigeon pea etc. will be grown to improve soil condition and supplementary income. On the unfertile barren lands, Water Absorption Trenches (WAT) would be constructed with dimensions of 3 m X 1 m X 0.67 m (depth). About 90 such WATs will be constructed per hectare with inter-space of 0.67 m. Stone bunding will be made where there will be a gully. Some semi-circular bunds will be constructed across the slope. Some pebbles will be kept in front of the bund to recharge the runoff into the ground. Permanent plants (12-15 varieties) like Butter tree (*Madhuca indica*), Minjiri (*Cassia siamea*), Sisoo (*Dulbergia sisso*), Arjun (*Terminalia arjuna*), Subabul (*Leucaena sp.*), Bael (*Aegle marmelos*), Indian laburnum (*Cassia fistula*), Indian jujube (*Zizyphus mauritiana*), Margosa (*Azadiracta indica*) etc. will be planted at the back side of the bund. Some fruit trees, like Mango, Guava, Cashew nut, Lemon will also be planted. Water harvested through the bunds is generally utilized to raise the permanent plant, which is planted at the backside of the bund. Semicircular bunds are arranged just like scales of fish so that water can be harvested and utilized properly. Efforts will be made to cultivate 5 – 6 different drought-tolerant crops during the first 3 – 4 years after planting (when the trees have not grown to cast shade). About 400 hectares will be supported from the project and the rest will be done through convergences.



Step Pond: Small and marginal farmers are organized into groups and are motivated to excavate new ponds and re-excavate old ones. The ponds have a three to four tier design. Three to four broad steps are made on all four sides to reach the centre. These steps remain

submerged during the rains. After the rainy season when the water recedes, the residual moisture of the steps is being used to cultivate vegetables which again add to total production. Apart from the rainwater directly falling in the pond, trenches are made to channel the run-off from the adjacent plots to the pond. From the bank on all four sides, trellis is made hanging over the pond for supporting creepers yielding vegetables like pumpkin, bottle gourd, bitter gourd etc. In the dry months, when the level of water in the pond falls, vegetables are grown on the broad steps of the pond. The pond bank is utilized for growing different vegetables,



pulse crops like pigeon pea and seasonal, semi-perennial, perennial and multi-purpose trees. Fish is grown in the pond for additional income. Water stored in the pond is utilized for irrigating fallows on both sides of it for growing a wide variety of vegetables. Cultivation on the steps, pond bank and fields is done organically. After assessing the total need of the group, yields from the pond, pond bank and newly cultivated fallows is equally shared among the members of the group. In such step pond excavation we encourage to make the depth higher so that after rainy season water remains collected for more number of days, evaporation and seepage is less. This helps to extend the growing season and fishery which add to the total income. The ponds will be excavated on the medium upland instead of upland where the run off will be stored. It is proposed to demonstrate one pond in each of village.

Minor Irrigation Facilities : Dug wells will be sunk in homesteads of medium uplands so that irrigation in nutrition gardens can be ensured. Depending on the availability of water, the wells will be of 5' diameter and 30' depth. In order to avoid erosion from the sides, earthen rings will be set. Beneficiaries will be selected in the group meeting. Even if it is owned by an individual, other members will have the right to use the water from it for lifesaving irrigation of their rainfed paddy, with the permission from the group.

Small farm ponds ("**Happa**") will be constructed especially in medium lowlands and low lands. The happa will act as a harvesting structure during the monsoons and also help to recycle sub-surface flow locally in the post-monsoon months. Lowland happa will be made in a series so that the initial monsoon rains are better harvested and the sub-surface flow can be arrested and recycled better in the post-monsoon months. Due to the erratic rainfall, the main crop paddy gets destroyed. The live saving irrigation is given with the stored rainwater which ultimately saves the paddy. Even if the happa thus made is owned by an individual, at least 4-5 owners of adjacent lands who are also members of the group will have the right to make use of the water stored in the happa to cultivate low water-demanding crops like mustard, linseed, wheat and vegetables in the winter. In case of scanty or no rainfall after fruiting stage, any one will be able to make use of this water from the happa for saving his rainfed paddy. Size of the happa varies according to the extent of land. The project will support making such a happa on 5-8% of land.



Multipurpose village woodlots in common lands: As farming becomes uncertain, landless community of the

village (about 40-45%) depend a lot on the wild for food-fuel and fodder. With the shrinking of forest cover and degradation of commons, the families always face crisis. We organize/assist community to form group, locate a fallow property (like lands, water bodies, river and pond banks, embankments of irrigation canals, roads and railway tracks), do 15-20 years lease agreement with the landowner, draw up a list of the trees/shrub/grass species preferred by them, raise seedling and plant on the land. Usually 12-15 varieties of trees & 6-8 types of shrubs are planted along with some seasonal crops in early period to get some short term return. Members ensure protection of the plantation & share the NTFPs harvested. In the long term as 15-20 years old trees will be felled 25% of the sale proceeds will be given to the village council/land owner and the rest shared equally among members. In the initial 2 years each family gets 20-30 kg of pulses. Fodder grasses could be harvested @ about 500 kg / family / year initially and about 600 kg / family / year from year 3 onwards. Firewood yield / family / year have been 100-110 kg / family / year from year 3 and it is increasing gradually.

MULTIPURPOSE VILLAGE WOODLOTS ON COMMON LANDS AS A SOURCE OF FOOD-FODDER-FUEL

PROBLEM

Common properties like fallow lands, water bodies, river and pond banks, embankments of irrigation canals, roads and railway tracks etc. remain unutilized. In other instances they are degraded due to overuse by the communities resulting in massive soil erosion or destruction of ecosystems.

Usually about 40-45% of the households in a village are landless. They earn their livelihood as farm labour, stone quarry worker, artisan etc; often raising goats, pigs etc to supplement their earning. In recent times these groups have faced a lot of difficulty as the area of forest and grazing lands are shrinking and the new 'social forests' created under government scheme plant only one or two types of non-browsable species such as Eucalyptus, Australian Acacias etc.

All these families depend on the wild for meeting their fuel need. With the shrinking of forest cover, the families always face an acute fuel crisis.

Intervention

Where 20 or more households of landless labourers, artisans etc live near a road or canal alongside which 5 to 10m wide stretch of barren land is available, discussions are arranged with all household members to assess their needs of firewood, fodder, construction material etc and to draw up a list of the shrub species preferred by them. If members agree to plant trees, shrubs etc and protect them, they are assisted to draw up a 15-20 years lease agreement and get it sanctioned by local village council. DRCSC assists the groups with seeds, training for raising seedlings and some costs of raising saplings & transplanting them. Usually 12-15 varieties of trees & 6-8 types of shrubs are planted along with some seasonal crops in early period to get some short term return. Members ensure protection of the plantation & share the NTFPs harvested. In the long term as 15-20 years old trees will be felled 25% of the sale proceeds will be given to the village council and the rest shared equally

Food Forests: Sudden strike of disaster creates food scarcity both for human and animals. Food forest is a forest by simultaneous planting of locally suitable, wild, rare species food producing plant varieties, strategic crops and edible weeds in fallow lands meant both for

human and animal consumption especially during/after disaster. These forests are economical, require less attention, conserve biodiversity and act as a shield to the soil.

Food Forest: Source of collected food and fodder for all seasons

Problem

The affected families live in a helpless state during and after natural calamities. At this time there is an acute scarcity of food and the families suffer from malnutrition. There exists a wide variety of indigenous trees that supply food and fruits which are rich in nutrition value but fetches a very low or no price when taken to the market. They have high tolerance value and can withstand natural calamities. These trees have an important role to serve in the bio-variety web. Many of these are on the way to extinction or are already lost. Collection from the wild had been one of the main sources of food (tuber, root, different types of weeds, juice etc) for the rural poor. With the degeneration of forest and other ecosystems, this source has gradually withered away resulting in acute malnutrition and scarcity of food for the poor families.

In villages especially in the semi-arid zone, large tracts of land remain fallow. In absence of any vegetation, soil erosion takes place.

Intervention

PRA was used to select the beneficiaries in the presence of local authority and other villagers. The groups were then formed after long discussions. DRCS negotiated with the Panchayat to let the groups in the villages cultivate the vested fallows to make it productive. Farmer groups were motivated to plant the extinct or near-extinct species of trees and strategic crops on a common land sanctioned by the Panchayat to be used by the group to create a Food Forest. The trees to be planted were selected by the group in accordance with their needs. Vegetables, pulses, oil seeds etc could be cultivated as interim-crops. The saplings were protected and nurtured by the group and the fruits and other produces were equally shared among the members, especially during and after natural calamities when no other food is available. The surplus was sold in the market.

Agri-wastes could be used as fuel and fodder. Fishery and duckery were introduced in places where there was a pond within the farm. The activities were conducted in collaboration with local government.

Introduction of integrated farming systems of individual farmers and farm clusters

Integrated Farming Systems – The integrated farms that will be developed are based upon the first principle of ecology that all the components of nature, biotic and abiotic are interrelated. It is an established principle in ecology now that stability of a system is enhanced by higher connectivity among different components among different biotic of a system. A stable system has:

- i. Maximum resilience capacity
- ii. Optimum productivity with maximum input use efficiency
- iii. Higher sustainability

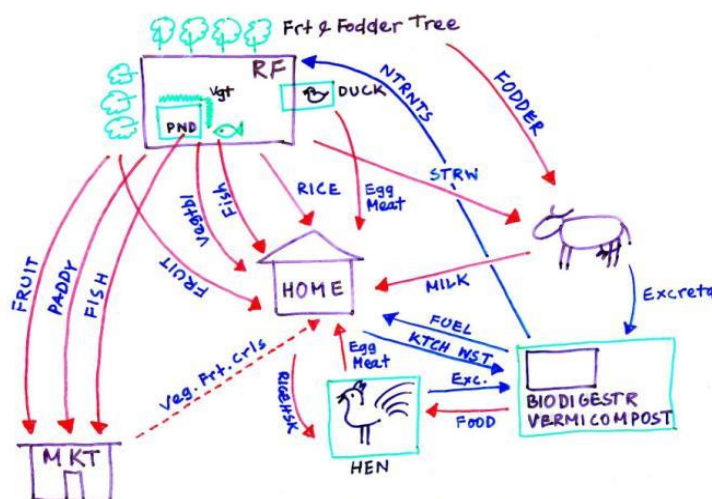
This has been illustrated amply by a number of experimental validations during the last two and a half decades. The basic principles to follow are

- Reduced tillage, biological tillage, mulch farming and other zero tillage systems reduces the necessity of heavy machineries and consumption of petrochemicals.

- Mixed cropping of plants with different root depth & structure, resulting in optimal utilization of water & nutrient & higher resilience against environmental stress. Multi-storey agro-forestry extend growing season and reduce soil erosion, while enhancing carbon sequestration. Use of locally adapted plants, animals etc. reduce the need for high external inputs (water, synthetic feed, petrochemical by products etc.)
- Biological soil inputs, which enhance capacity of soil to store water, carbon & nutrients reducing need for synthetic chemicals / soil nutrients. Soil & moisture conservation steps that improve stress tolerance reduce soil erosion & siltation of water bodies and less groundwater pumping hence reducing petrochemical burning.
- Use of renewable energy resources for irrigation, crop drying, threshing etc. which reduces need for petrochemical.
- Varietal diversification of the major crops grown in the project area will be promoted. Further traditional technologies which are beneficial in the present day context with respect to climate change adaptation will be emphasized.
- Seed production of major crops will be emphasized in order to make the project villages self sufficient in seed supply.

Adaptation strategies/hypothesis for IFS:

- Time Management to tackle erratic rainfall, longer dry spell and untimely rain
 - Preponing/postponing crops as preparedness and preventive activity.
 - Postponing crops as rehabilitative activity. Crops like barseem, mustard, coriander etc.
- Space Management to introduce multiple production component and increasing diversity so the dependency on one component is reduced
 - By introducing ditch/canal/pond in the low land to drain out the water, and making the low land cultivable. The water can be used for aquatic system.
 - By adopting agro-forestry system to have tree-crop combinations together in the same space.
- Diversifying livelihood and production system through integrating various subsystem (crop, tree, aquatic, livestock, poultry (preferably desi poultry birds), so the produce are distributed in various season and space so that if one is lost due to disaster, other can support the livelihood. It is based on locally adopted crops so adjustability is high.



- As the system is integrated, i.e., output of the one subsystem is used as input of others, the cost of production is reduced – which has the scope of having more amount of cash in hand.

Nutrition Garden: In the project villages, small nutrition gardens of area about 40 m² per household will be promoted in the homestead lands. At present, the families are in the practice of growing 2-3 types of crops in a scattered manner during the rainy season. Through interventions planned in this project, the beneficiaries will be able to harvest nutritious vegetables (leaves, fruits, roots, tubers, legumes etc.) for more than 9-10 months.

NUTRITION GARDEN ACTIVITY BY WOMEN'S GROUPS

PROBLEM

The marginal and poor families usually have a small front yard and/or a back yard around their living space where they grow one or two vegetables haphazardly punctuated by two or three fruit trees. These families, especially the women and children mostly suffer from malnutrition. The problem aggravates during natural calamities.

To support marginal or poor farmers as well as landless households to utilize front yard, backyard space around their living space to grow some nutrient rich vegetables, fruits etc through recycling of household waste, grey water etc. The aim is to ensure that all family members especially women & children consume at least 150-200gm of green vegetables / fresh fruits per person per day around the year.

INTERVENTION

Women and sometimes adolescent children are organized into small groups of 12-20. Garden Maps & Seasonal Calendars are prepared for each household to identify present production & consumption pattern and identify factors that limit productivity, length of growing season etc. DRCSC provides seeds & bio-inputs & arranges trainings, exposure trips etc so that new crops & varieties, cropping patterns, bio-fertilizers & bio-pest repellents, crop-tree or crop-animal/bird combinations is tried out on a small scale by at least 2/3 group members and all the members are encouraged to try out 2-3 techniques / inputs / crops etc. Apart from vegetables / fruits etc group members grow culinary & medicinal herbs, ornamental plants, erosion control plants etc. Group members save seeds and share it with neighboring households also. Group members also discuss preparation of nutritious food, their preservation methods etc.

Strategic crop demonstration: Agriculture in disaster prone areas are the most vulnerable under climate change related threats, but there are number of native crops which can tolerate stress. As an example, rice has numbers of varieties, which can tolerate drought-water stagnation-salinity etc. We have about 350 indigenous rice varieties with us which are demonstrated through trial in the farmer's field. There were number of minor millets, oil seeds and pulses which can give better yield under drought like condition, tried out in dry lands. Strategic tuber crops like elephant yam, tapioca etc which can be stored under the soil if not harvested, can supply carbohydrate during/after stress period.

Uncultivated food: There are number of edible weed, unconventional fruit, unknown leafy vegetables which the minority communities use to collect from the commons to meet their nutritional need. These don't need much care and water; we encourage those by collecting information bringing it under cultivation practices.

Mixed cropping: The poor families, especially in dry lands, are organized into groups and motivated to make the unfertile fallows cultivable by adopting soil and water conservation measures like making circular bunds and trenches; growing cover crops, minor millets, oil seeds, pulses and some leafy vegetables; planting drought-tolerant multi-purpose plants and trees and many more. As it improves soil quality, retains moisture in the soil – the farming season is expanded. Mixed cropping reduces dependency on single crop, hence reduces vulnerability. Mixed cropping is also promoted in individual farm level.

Mixed cropping with minor millets in permanent fallows

Problem

Large tracts of land lie as permanent fallows in the semi-arid region in the west of West Bengal which is characterized by an undulated landscape with red lateritic unfertile and rocky soil. These fallows are used traditionally as grazing grounds for the cattle, which is one of the major causes of soil erosion. Thus, on the one hand potential natural resource gets wasted due to lack of proper management and the poor families do not have food, fodder and fuel for the whole year on the other.

Intervention

The poor families are organized into groups and motivated to make the unfertile fallows cultivable by adopting soil and water conservation measures like making circular bunds and trenches; growing cover crops, minor millets, oil seeds, pulses and some leafy vegetables; planting drought-tolerant multi-purpose plants and trees; excavating ponds for rainwater harvesting and many more.

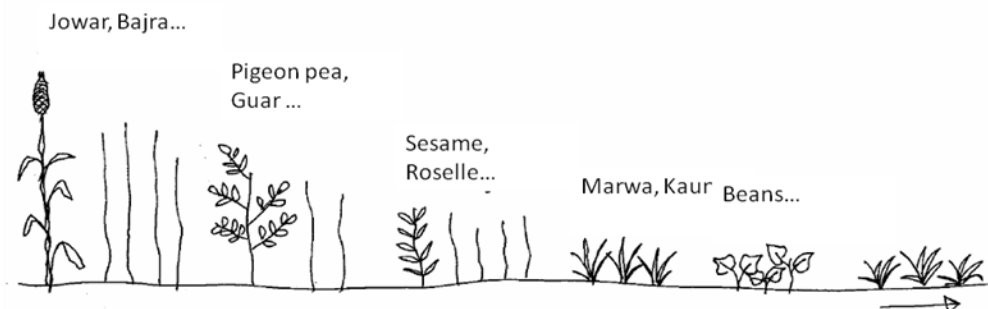
Cultivation without irrigation/tillage: A week or two before the rainfed rice/main crop is harvested; seeds of legumes/pulses/oil seeds are broadcasted in the field. Residual moisture in the soil helps the second crop to germinate. Eg. Linseed/lathyrus/mustard after rice or mustard after taro. If the soil is muddy then by providing a straw shield and without soil digging, potato cultivation is possible requiring no irrigation.

System of Rice Intensification (SRI): Rice is the main crop of West Bengal . Apart from rainfed rice, winter rice is cultivated with underground water. SRI is a technique of sowing single rice sapling under controlled irrigation. The yield increases by 1.5 to 2 times, seed cost reduction is 80% and water saving is about 25% to 50%. The method is getting popularity in Gangetic plain, but can work in dry condition also.

Lateritic zone (Suggested model – will be refined after PVCA, WUMP and LUP)

Managing time to address low water availability in field

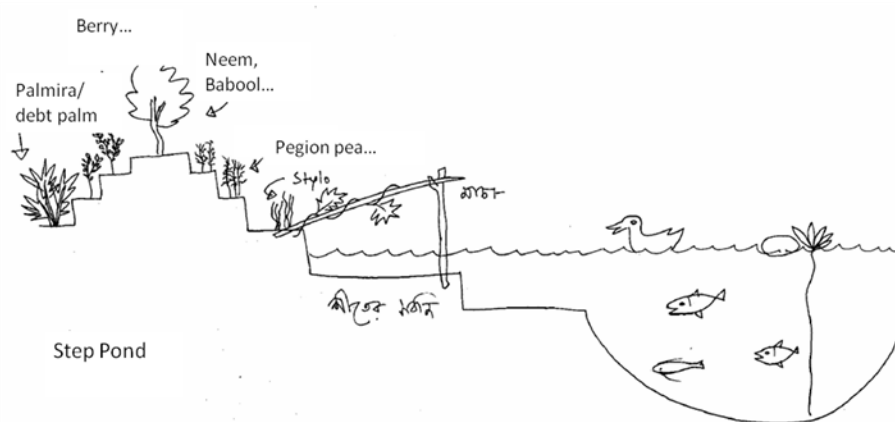
- a) Crops planted at a time, but harvested in different time span by mixed cropping of different root depth, different height.



- b) Planning in a seasonal way with proper crop rotation so that moisture is properly used and soil health is maintained.

	RAINY/KHARIF	WINTER/RABI	PRE KHARIF
UPLAND	Paddy + Black gram Or Maize + soybean	Wheat + Mustard + chickpea Or Chickpea + Linseed + Sesame Or Safflower + grass pea + linseed	Cluster bean
LOW LAND	Jute or Indian spinach. bean + Radish	Pea or Field bean or French Cluster bean	Lady's finger + or Vegetable Amaranth + Cluster bean
	Taro/Zinger Or Cassava + ground nut Or Black gram		Cowpea + Sesame

- c) Include multi-tyre system in pond bank and water harvesting structure for optimum utilisation of soil



moisture.

- d) Focus more on local breeds of small ruminants (rabbit, pig, chicken, pegion, duck, goat, sheep) for livelihood integrated with fodder cultivation to reduce stress on agriculture and water.

Post Harvest Management



Grain Bank: During the harvesting season a group of 20-25 people saves some of their produce in the community grain bank. At the time of scarcity and disaster, grains can be borrowed from the grain bank at a very low rate of interest, which is returned back to the gain bank. This can provide support during sudden attack of disaster.

Issue

In most of the villages, there is no agricultural work during September-November and March-May. Naturally, hunger looms large over the poor families who earn their bread by working as agricultural labourers. The living condition gets even worse in the event of natural calamities like flood, drought or cyclonic storms. With only the walls at their backs, they are compelled to take loan from the local moneylenders at abnormally high rate of interests by mortgaging their assets and labour. In many cases they have to migrate to neighboring districts in search of work.

Approach

Adult male and female members from 20-25 households are organized to form a group and motivated to set up grain banks as a measure to tide over the food crisis during the lean period and also during and after disasters. The bank is set up within the homestead of any member. In the flood prone zone, it is positioned at an elevated place where usually flood waters cannot reach. Grain is stored in large bins made with straw rope, mud, bamboo etc donated by members and usually constructed with their own labour. In cases where a stone or concrete platform is used as base to avoid rodent & pest attack, a regular mason has to be employed. Each member deposits a fixed amount of grain during the harvesting season and DRCSC deposits a matching grant of an equal amount of grain.

They take loan from the bank during the lean season and return it with a small amount of interest in the next harvesting season. The amount of interest goes to increase the stock of the bank. The group members make their own rules regarding lending, mode of repayment and rates of interest. Members keep record of lending, repayment etc.

Action

In the last ten years, DRCSC has catalyzed and supported 225 Grain Banks with 2400 households as members in different districts of West Bengal. Most of the banks have enough grain reserves to last for 60 days. Selection of the members for the grain bank is done after a detailed PRA exercise and food security analysis of each of the household in the village. The economically poorest families in the village are preferred and given the first priority for enrollment as members of the grain bank. During the harvesting season, the group members save a portion of their harvest (usually 50 kg) in the community grain bank. DRCSC gives an equal amount as a matching grant. At the time of scarcity or any disaster, paddy can be borrowed from the bank at a low rate of interest decided by the group. The amount of loan with a small amount of interest is returned to the bank after the next harvest. The interest goes to increase their stock. It is most interesting to note that more than 80% of the grain banks already established is run by the women's groups.

Seed Bank: Getting seeds is a big problem if crop is lost due to disasters. Efforts are made for seed collection and preservation at the grass root level. The groups are keeping stock of native variety seeds suitable for their dry zone in accordance with their need. Due to erratic nature of rain crop damage is a common phenomenon. As



the farmers are preserving seeds that is how they are combating the climate situation. Seeds are shared during stress and post disaster.

Promotion of climate adaptive appropriate technology

Biogas: The poor and marginal families in the villages meet their fuel need by gathering fuel wood from the wild. But their sources of collecting fuel wood and dry sticks are gradually getting limited due to a fast disappearing forest cover. As a result, they are compelled to make use of dung cakes directly as fuel. On the other hand, cow dung is stacked in large pits on the ground which is kept in the open to dry and rot. This rotting mass produces methane gas and invites environmental problems. This sun-dried cow dung is less effective as a fertilizer. Bio-gas plants can be a solution for all these, with joint initiative of govt., DRCSC and the beneficiary concerned. Instead of using dung cakes directly as fuel, the dung produced in the cowshed is used as input for the bio-gas plant to generate the gas used for cooking and illumination. The bio-gas slurry is being used as fertilizer in agriculture field, fishery etc. Bio-gas stove of 2 CuM (250 nos.) is proposed to be demonstrated under the project.



Energy efficient oven: The households of the project area mainly use open stove/ chullah for regular cooking purpose. This increases the firewood consumption, and also has adverse effect on the health of the women. To reduce the consumption of fuel and drudgery, the improved chullah will be installed / constructed at individual family level. It is envisaged to set hot water storage tank with the improved chullahs so that about 12 ltrs of hot water may be made available besides cooking, using the same firewood. The experience has shown that the improved chullah will help to save at least 3 kgs of firewood (on an average) per day. This will also help in reducing carbon emission (5.4 kg per day on an average). It is proposed to cover 2400 poor families with this intervention.



Water harvesting and Water filter:

Crisis of drinking water reaches the peak during periods of climate stress. During the floods, the tube wells get inundated thus polluting the source and in absence of alternatives, people are compelled to drink the polluted water. Similarly, during droughts, underground water levels are so low that the tube wells are unable to lift any water. People have to depend on ponds as the only source for drinking water. This results in a spate of water-borne diseases like diarrhoea, dysentery etc. Use of low-cost water filters for filtering water collected from tube wells and ponds will help in reducing these diseases during climate stress period. At the same time, 5 nos.

community-based rainwater harvesting structures will help in storage of water, which after filtration will be used for drinking during the stress period. Low cost water filters will be distributed to 2500 families.

Component 4: Advocacy for influencing government policy through promotion of best practices and realization of WUMP & LUP

Advocacy for realizing the WUMP and LUP

The exercises (PVCA, WUMP, LUP) have an empowering effect by reinforcing people's capacity for collective action, enabling communities to understand the risks they face and identifying opportunities available to manage those risks. The exercises will also try to assess the resources required for the plan and map the possible convergence with the existing government schemes and programmes under NGREA, watershed etc and will do advocacy and linkages to realize that plan.

Why local level planning is important for building resilience

- Vulnerability and adaptive capacity are context-specific; they result from the interactions between many socio-ecological factors and processes such as income level, settlement patterns, infrastructure, ecosystem and human health, gender, political participation and individual behavior. Regional or national vulnerability indices often mask the dramatic variations in vulnerability at local levels.
- Adaptation action is best observed at local levels. The anticipated or actual experience of climate change impacts shape adaptation decision making and action – the latter being the translation of knowledge and capacity into behaviours and activities. Individual and household decisions about livelihood strategies and investments (e.g. crop selection, equipment purchase, skills training, and contingency planning) can represent real-live demonstrations of adaptation.
- India has NAPCC and corresponding SPACC in West Bengal. For translating national and state policies into action, especially at panchayet level, and decentralizing SAPCC objectives into local context, the role of planning and taking it to local level planning of Gram Sansad, MGNREGA planning, IWMP etc are very important. Currently the local level planning is not considering climatic threats in to consideration.

Promotion of Best Practices

Access of learning outcomes in the targeted villages as well as public domain will be ensured through various means such as dedicated website and other printed materials, environment education classes/events in schools targeting direct beneficiary families and indirect beneficiaries as well. The documents thus produced will be used for general awareness, capacity building of different stakeholders, as materials for advocating the models created through the project and for influencing policy decisions.

Networking, exchange and sharing of good practices and advocating for influencing policy decisions

Networks and partnerships built with relevant organisations, POs, CBOs, climate activists/experts etc for strengthening awareness and ownership of adaptation and climate risk reduction processes at local, state and national levels. The effectiveness of climate resilient models will be thoroughly documented with best practices as well as failures and will be

disseminated through different audio visuals, print publications, fairs, farmers meets & exhibitions.

At district level, workshops, seminars, meetings, trainings, etc. will be organised with different stakeholders like government officials, PRI members, CBOs, POs, Groups etc to facilitate different convergences and raise the general level of awareness regarding the climate issues.

At state and National levels various seminars & workshops will be organised for cross learnings, sharing of experiences and influencing policy decisions.

B. Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project / programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund.

Benefit Areas	Key benefits	Baseline scenario
<i>Social</i>	Land use and water use plan ensures equitable distribution of water and sustainable resilient technology improves the income, reduces the drudgery and outmigration is controlled	In-equitable distribution of irrigation water, increased drudgery of women, migration of landless
<i>Economic</i>	Improved production and productivity, livestock and livelihood enhancement through implementation of various climate resilient technologies coupled with timely weather advisory.	Low production and productivity due to uncertain weather, water scarcity, land degradation and resultant low income Low level of production from livestock due to lack of fodder
<i>Environmental</i>	Soil and water conservation, minor irrigation and interventions in multi-purpose common lands are expected to regenerate degraded environment.	Degraded land, depleted water and soil resources regime, etc.

Some indicative quantitative measures with respect to social, economic and environmental benefit are presented below:

Particulars	Quantitative Measures
Social Benefit	Land use and water use plan in 40 villages involving 5000 beneficiaries in 2000 hectare of area ensures equitable distribution of water for irrigation, drinking and water dependent livelihood. Sustainable resilient technologies will improve <ul style="list-style-type: none"> • 45% income of at least 4000

	<p>households</p> <ul style="list-style-type: none"> • 70% reduction in out migration • 2500 women will save 3-4 hours/day time to divert it towards livelihood actions • Food diversity (nutrition) to increase from 3-4 types to 8-9 types
Economic Benefit	<ul style="list-style-type: none"> • 80% improvement in production • productivity to be improved to 1200 kg/ha (round the year) • fodder availability will be assured for 60% households • 45% increase of income for at least 4000 families • 02 Weather Stations will provide crop-weather advisories to 15000 farmers. • income sources will be diversified. Now they are making their incomes from almost 3 types of sources, after the project intervention the sources will be of 6 types. • Additional 220 ha of land to be brought under cultivation • 1000 ha of land to be brought under double/triple cropping system • cropping intensity will be increased to 300% • cropping season extended to 10 months from 4 months
Environmental Benefit	<ul style="list-style-type: none"> • 400 ha of land will be covered under Soil and water conservation measures, minor Irrigation facilities • 280 ha of forest/Community land will be protected • At least 30 number of local breeds, seeds and tree species will be revived • Water holding capacity will increase • Biodiversity will increase • 30 ha of water bodies will be created/renovated for storage of 160000 cm³ gallon rainwater

C. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme.

Sub-component	Current addressing mechanism and loopholes	How this project trying to address this	Cost effectiveness
LUP and WUMP	Water harvesting through IWMP, MGNREGA etc. hardly considers future climatic trends. Support for bore well, submersible pumps are causing more trouble.	Including climate perspective in the planning through WUMP and LUP, it is also considering reduction of water foot print, calculate water demand for future and predict suitable location through trend analysis. The focus is more on demonstrating some small irrigation measures and taking it to the mainstream planning. The demonstration of low water demanding local crops and small ruminants will also be taken up.	When compared, the planning exercise is bringing invaluable climate resilience factor in the mainstream planning so that all the plans are converged and contextualized - which will make the entire investment, from this project and other schemes by the mainstream, sustainable and usable in the longer run and address the water stress scenario.
Weather Station and CRC	Early Warning System (EWS), which is most of the time not effective and timely and not clubbed with related advice. Poor insurance for small losses – not addressing cases in interior villages.	SMS advice coupled with weather information for better and advanced planning of agriculture and other NR dependent livelihoods.	Timely EW and advice related to agriculture and other NR dependent livelihood will reduce chances of greater cash loss due to shocks and disaster. Existing channels for information Dissemination would also be used.
Soil & Water Conservation Measures	Soil and water conservation is being taken-up under watershed programmes under Integrated Watershed Management Programme (IWMP). however, the same do not include climate concerns in the design and implementation mechanism.	Based on ecosystem wise micro planning the rainwater conservation structures will be made to store rainwater. Climate concern would form important part of the component design. This stored water will reduce the uncertainty of rain-fed farming, improve cropping intensity, productivity, aquaculture opportunity will be created and thereby the income opportunities will increase. Soil health will be improved, resulting in productivity improvement	Existing learning from community based soil and water conservation based projects / programmes would be incorporated. The stakeholders would be involved in planning, execution and monitoring, use of locally available material would be encouraged.

Sub-component	Current addressing mechanism and loopholes	How this project trying to address this	Cost effectiveness
Sustainable Integrated Farming System	Efforts are not integrated and holistic. Location specific design are not popularized. Integration of climate concerns in farming systems is lacking	The skill and knowledge of farmers will be enhanced and they will be able to design their production system according to climatic situation.	Creation of demonstration models. Use of exiting extension channel and network is envisaged under implementation.
Disaster proofing measures like community grain banks, seed banks of local seeds, fodder banks	Such measures are not available due to which availability of seed as well as grain during stress periods is limited.	To mitigate with the disaster situation the grain, fodder will be stored at low cost at the time of harvest.	The storage structures will be made using locally available materials so that those can be maintained locally. Farmers will themselves store seed and will be able to sow at proper time. The local methods, practices and materials will be combined with appropriate knowledge to reduce the cost in long term.
Appropriate technologies like energy efficient ovens, biogas, low cost water filter, community water filter.	Penetration of improved cook stove and bio-gas very low in rural areas leading to indoor pollution. Efficiency of the system is poor. Poor quality drinking water particularly in monsoon season and low water availability period (summer) leads to increased number of water borne diseases	Energy security, clean energy, safe drinking water important for rural livelihood. The women drudgery will be reduced. The saved time (from collection of fuel, cleaning, cooking time etc.) of women can be used for other livelihood options.	Low cost, low technology based models will be developed. The energy saving devices will reduce the recurring expenditure for fuel. The local service providers will be able to maintain these products easily.
Advocacy and sharing of best practices	Limited or no Existing channels of knowledge dissemination related to climate change. Non-availability of location specific information related to climate resilient technologies	Information and knowledge dissemination material would be published and circulated. Training and network meetings would be conducted.	The wide range experience sharing will be made through circulation of low cost public education materials. Use of world wide web (www.) through creation of website. Existing extension channels would also be used.

D. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

Key National Policy and Responsible Agency	Project elements consistent with policy
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Key National Policy and Responsible Agency	Project elements consistent with policy
1. National Agriculture Policy	Irrigation water management, soil moisture conservation, soil conservation, land conservation in watersheds, organic agriculture, home gardening, integrated pest management and integrated plan nutrition systems, conserving agro-biodiversity and promoting tolerant species
2. National Disaster Management Policy	Early warning systems linked to community preparedness and risk assessment
3. National Forest Policy	Increasing tree cover in non-forest areas, reducing pressure on natural forests by supporting community woodlots, management of Multiple-use forests
4. National Environmental Policy	Restoration and conservation of ecological systems, conservation of native species and agro-biodiversity, water resources conservation and management, soil conservation
5. National Livestock Policy	Promotion of livestock farming to increase incomes and food security of rural farming households

Details on component-wise applicable national and sub-national plans are given below:

Project Components	National Action Plan on Climate Change – Priorities/Strategies	State Action Plan on Climate Change for West Bengal – Priorities/Strategies	12th Five Year Plan - Priorities/Strategies
Communities to develop protocol for collective management and regulating entitlements for equitable access and use of water through short term, long term and micro-watershed level understanding of climate change related impact and solutions merged with scientific knowledge.	The “National Water Mission” which is one of the mission identified under National Action Plan on Climate Change focuses on improving water storage capacity, creation of new water harvesting structures, soil moisture conservation structures etc.	Creation of Rain water harvesting structures in the undulating slopes of the Red and Laterite soil area. Construction of check dam for harnessing surface water Implementation of special programme for planting forest trees or fruit plantation s as appropriate to increase the run off infiltration ration.	Watershed development and soil conservation investments have to be complemented with farming systems investments in a watershed-plus framework that takes into account the diversity of rain-fed agriculture.
Climate risks on livelihoods to be reduced and annual production stabilized through introduction of natural	The “National Mission for Sustainable Agriculture” which is one of the missions identified under	Creation of Seed bank Enhanced livelihood of small and marginal farmers by introducing the concept	There is a need to give emphasis on integrated farming systems, combining crops and livestock,

Project Components	National Action Plan on Climate Change – Priorities/Strategies	State Action Plan on Climate Change for West Bengal – Priorities/Strategies	12 th Five Year Plan - Priorities/Strategies
resource based diversified and integrated alternative production systems.	National Action Plan on Climate Change focuses on improving productivity of rain-fed agriculture by adopting suitable agricultural techniques.	<p>of Integrated Farming System by pooling in their fields for practicing each element of the Integrated Farming System</p> <p>Up scaling of Resource Conservation Tillage Technologies</p> <p>Effective soil nutrient management</p> <p>Promote organic ways for combating weeds, insect, pest and diseases and nutrient management.</p> <p>Real time crop monitoring and weather forecasting</p> <p>Setting of Agra-Information Center in each of the state of West Bengal</p> <p>Feed and fodder development for livestock</p>	<p>including small ruminants, for different location-specific endowments</p> <p>Strengthening soil organic carbon (SOC) research, particularly on the quality of organic matter and microbial activity, physical properties of SOC, validation and refinement of models and SOC dynamics under different land uses and management regimes.</p>
Awareness regarding climate change and its impacts is improved and climate resilience practices gain popularity not only in the targeted area, but also at local, state and national level.	The “National Mission on Strategic Knowledge for Climate Change” which is one of the mission identified under focuses on creation of awareness on climate change adaptation among the farming community.	<p>Appropriate crop diversification through training & capacity building of farmers</p> <p>Capacity building of farmers for effective adaptation to climate change</p> <p>Real time weather monitoring and forecasting</p>	<p>The need to increase total domestic energy production in order to reduce import dependence, combined with the need to move away from fossil fuels in the longer run in view of climate change considerations, points to the need for stronger efforts to increase the supply of energy from renewable.</p> <p>Capacity building of farmers for effective adaptation to climate change</p>

E. Describe how the project / programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

The list of applicable standards for various components proposed under the project are presented in the table below:

Activity	Applicable standards	Application to Project	Monitoring
1. Weather stations & Climate Resource Centres (CRCs)	Technical standards of the instruments to be installed in Automatic Weather Stations & CRCs	By DRCSC Project Management Unit	By DRCSC project Management Unit By District level Project Monitoring Committee By State level Project Monitoring Committee
2. Soil & water conservation measures	Technical standards for creation of Soil & water conservation works, plantation, Check Dam. Micro irrigation, River Lift Irrigation as per Panchayati Raj & Rural Development, Water Resources Devt. Dept of the Govt. of West Bengal.	By DRCSC Project Management Unit District Panchayati Raj & Rural Development Dept. Water Resources Devt. Dept.	By DRCSC project Management Unit District Panchayati Raj & Rural Devt. Dept. District Water Resources Devt. Dept. State level Project Monitoring Committee
3. Livestock development	Standards applied by Animal Resources Development Dept. of the Govt. of West Bengal.	By DRCSC Project Management Unit By Animal Resources Development Dept.	By DRCSC project Management Unit Animal Resources Development Dept. State level Project Monitoring Committee
4. Integrated Farming System	Standards prescribed by Dept of Agriculture, Dept. of Fishery & Dept. of Panchayati Raj & Rural Development, Dept. of Animal Resources Development of the Govt. of West Bengal.	By DRCSC Project Management Unit District Agriculture Dept officer District Panchayati Raj & Rural Development Dept., Dept of Animal	District Agriculture Dept., District Panchayati Raj & Rural Devt. Dept., Dept of Animal resources Devt.

Activity	Applicable standards	Application to Project	Monitoring
		resources Devt. Dept of Fishery Dept. of Animal Resources Development	District level Project Monitoring Committee State level Project Monitoring Committee
5. Disaster-proofing measures like community grain banks, seed banks of local seeds, fodder banks	Standards prescribed by District Agriculture Dept., Bidhan Chandra Krishi Viswa Vidyalaya (BCKV – Agriculture University),	By DRCSC Project Management Unit Dept of Agriculture	DRCSC Project Management Unit District Agriculture Dept District level Project Monitoring Committee State level Project Monitoring Committee
6. Appropriate technologies like energy efficient ovens, biogas, low cost water harvesting, low cost water filter, community water filter.	Standards prescribed by West Bengal Renewable Energy Development Agency (WBREDA)	By DRCSC Project Management Unit West Bengal Renewable Energy Development Agency (WBREDA)	By DRCSC project Management Unit By District level Project Monitoring Committee By State level Project Monitoring Committee

F. Describe if there is duplication of project / programme with other funding sources, if any.

The project target area is not the focus of any other climate adaptation initiatives. In fact, this is the first, focused effort to implement a climate adaptation project based on identified priorities on the ground. A number of NGO-led micro projects are field testing adaptive strategies on a much smaller scale. For example Christain Aid, UK and KKS, Germany supported projects for enhancing the food & livelihoods of backward poor people (mostly Schedule Tribes and Schedule Caste) of some villages in Purulia. WHH, Germany has supported for developing the model of sustainable Integrated Farming System for dry-land among the tribal communities in only few villages of one Gram Panchayat of Bankura district. The lessons and practices of these micro projects have influenced the design of the activities, delivery/monitoring and assessment modality.

This project would be the first one to explicitly focus on improving the resilience of communities and preservation of ecosystems as an adaptation strategy. This project will complement on-going government programs that are being implemented to improve rural agricultural productivity, manage drought and landslides, irrigation and watershed management, and conservation of biodiversity.

Project	Objectives	Complementarity	Geographical Coverage/Agency
National Food Security Mission	To increase the production of rice by 10 million tons, wheat by 8 million tons and pulses by 2 million tons by the end of the Eleventh Plan (2011-12) in order to ensure food security.	The project proposes the transfer of sustainable technologies as also the distribution of improved local variety seeds for increasing the existing farm production thereby ensuring food security of the small and marginal farmers.	Deptt. of Agriculture, GOI
Bringing Green Revolution to Eastern India	To rejuvenate the farm sector with Techno-managerial advancements to enhance the Productivity, Profitability & Sustainability of the major farming systems in different Agro-climatic regions, thereby attracting and retaining educated youth in farming and substantially improving the livelihood of the farmers of the state.	The project proposes to act as a complement to the programme in discouraging lifting of ground water and increasing growing season by developing micro watershed-based climate-adaptive sustainable agriculture.	7 states in Eastern India including West Bengal. Dept. of Agriculture, GOI
INTEGRATED SCHEME OF OILSEEDS, PULSES, OILPALM & MAIZE (ISOPOM)	To harness the best of production & productivity, processing and post harvest management technologies to accelerate self-reliance on Oil seeds and Maize.	The project proposes to introduce indigenous varieties that are less water intensive, low fertilizer demanding, soil fertility enhancing seeds as against hybrid varieties supplied by ISOPOM	Deptt. of Agriculture, GOI
Dry land Farming programme	To increase the agricultural production and improve the economic condition of the dry land farmer through development of selected micro-	The project proposes to complement the objectives of the national program only with the exception of introduction of drought-tolerant	Deptt. of Agriculture, GOI

Project	Objectives	Complementarity	Geographical Coverage/Agency
	watershed, use of improved drought-resistant seeds, fertilizers, improved implements and agro-forestry programme etc.	indigenous variety seeds instead of HYVs and also an innovative crop selection.	
Mahatma Gandhi National Rural Employment Guarantee Scheme	It is designed at improving the income protection of the people in rural areas by ensuring hundred days guaranteed employment in a financial year, to a rural family.	The project proposes to augment the income scenario of the rural families by making provisions for employment of at least 50 more days over and above the 100 days guaranteed by the govt.	National level programme implemented by the Panchayats
Rashtrya Krishi Vikas Yojana	To ensure the preparation of agriculture plans for the districts and the states based on agro-climatic conditions, availability of technology and natural resources. To ensure that the local needs/crops/priorities are better reflected in the agricultural plans of the states.	Through its actions, the project proposes to fill up the gaps between the actual need of the all-round development of the beneficiaries and the extent to which the national program fulfills it. Project support will be limited to the introduction of the components that are not supported by RKVY.	National level programme implemented by the Deptt. of Agriculture, Govt. of West Bengal.

G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

The entire project idea is based on generating local micro climatic knowledge and using it for betterment of livelihood and environment status through

- PVCA : understanding of vulnerability and capacity of the community through PRA exercises, GIS maps and climate data analysis
- WUMP : water status and water use planning
- LUP: land use status and related planning
- Weather data: collecting real time data through weather stations

All the four components will have involvement of the community. The management of weather forecast will be done through following components

- SMS based dissemination: The real time weather data will be linked to climate modeling to generate short term forecasts. This forecast will be analyzed by local experts in the light of impact of this in agriculture, livestock and fisheries. After that the real time weather information, short term forecast and related advice will be sent to the subscribed beneficiaries through SMS or voice messages.
- Climate Resource Centre: Will be located in each of the 2 districts, and will contain PVCA, WUMP, LUP and all weather and climate related data, relevant maps, information and manuals on livelihood etc. Will be used by the community and researchers.
- Knowledge management portal: The entire knowledge along with process documentation will be uploaded in a knowledge portal for public access.
- TTC Centre will be established at village level for experience sharing among different stakeholder and capacity building of the beneficiaries will be enhanced by the climate experts, universities, NABARD, Govt. Depts. etc.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy of the Adaptation Fund.

The processes followed for developing this proposal were

- Studying background papers like
 - Disaster Management plan, West Bengal Government
 - SAPCC West Bengal Government
 - Policy brief by Dr. Swadesh Mishra, Ex-Agricultural Meteorologist & Rainfall Registration Authority of West Bengal
 - Status of climate in India by IMD
 - Reports from School of Oceanographic Studies etc
- Referring reports of earlier works done by DRCSC, especially
 - Diversifying livelihood options through integrated production system for climate change adaptation and food & livelihood security of the small and marginal farmers in water logged flood plain of West Bengal (CCA IFS), supported by GiZ and MoEF, GoI
 - Collective Action to Reduce Climate Disaster Risks and enhancing Resilience of Vulnerable Coastal Communities around the Sundarbans in Bangladesh and India”, supported by European Union
- Series of Participatory Resource Appraisal exercise in selected villages with the community to understand the problem, stress and resources
- Series of meeting and skype conference done with MoEF, Government of West Bengal, along with GiZ as an expert agency. The idea was presented in a meeting in September, 2013, attended by them.
- Series of consulting meeting with NABARD, West Bengal.
- A sharing & planning meeting was organized in each district with officials from Dept. of Agriculture, Horticulture, Sericulture, Fishery, LAMP Society, Block Administrative Office,

PRIs, DRDC, Scientists etc. and individual farmer, group & cluster representatives and other representatives from NGOs on 23rd March and 22nd August, 2013.

In all four consultations (two each in the targeted two districts) have been organized, where at least 4 representatives (2 male + 2 female) from 20 vulnerable villages attended and shared their problems caused by the impacts of climate change, before the Govt. officers and climate experts present. The community also shared their indigenous coping mechanisms to the climate variability/change, which were later validated by the climate experts. During the consultative process, few new ideas for addressing the impacts, have come up and the same were discussed in detail with the climate experts present.

The focused areas which were been discussed during the Stakeholder Consultation are pointed below.



Those present at the Discussion on Climate Change Adaptation included district level govt. officers from the departments of Agriculture, Horticulture, Sericulture, District Coordinator of SRD Cell. Block level officers present in the meeting included Development Officer, Asstt. Director of Agriculture, Livestock Development Officer, MGNREGS Cell, Veterinary Officer etc. Apart from govt. officers, elected members of

Panchayat Samity and Gram Panchayat like the Chairman of the Standing Committee, one Panchayat Pradhan were also present. Among others were the Headmaster of the local school, representatives of different NGOs working in the area and members of beneficiary households from 20 villages were present. They were of the opinion that food and livelihood security of the people living in the targeted villages is getting affected by the impact of Climate Change. They also talked about the models they have created for climate change adaptation. The different models developed by DRCSC for the purpose of climate change adaptation in the fields of agriculture, livestock, fishery, soil-water conservation, energy efficiency, NR-based LHH and micro-enterprises, were also discussed.

The issues that were raised regarding climate change adaptation in agriculture were:

- α) crop selection
- β) sufficient seed stock in the hands of the farmer
- χ) preparatory moves to combat drought situation
- δ) cultivation of a mix of seasonal, annual and perennial crops and trees instead of mono cropping
- ε) importance of cultivating local traditional varieties
- φ) promotion of sustainable agriculture instead of chemical agriculture



- γ) giving importance to ecosystem-based cultivation practices instead of mono cropping
- η) reintroduction of minor millets
- ι) documentation of local knowledge and applying it in agriculture on priority basis
- φ) providing the farmers with information on local weather on a regular basis
- κ) rainwater harvesting and reducing risks by developing minor irrigation system
- λ) cost reduction in agriculture
- μ) laying importance on post-harvest management for getting better price of crops

In so far as horticulture is concerned, the following issues were emphasized:

- a) making nutrition gardens in every house
- b) preparing vermi-compost by recycling farm waste
- c) orchard plantation
- d) mixed orchard plantation
- e) cultivation of commercial vegetables
- f) increasing the cultivation of crops involving less risk

Sericulture plays an important role in climate change adaptation. While discussing this, the following points were brought to the fore:

- a) Arjuna-based Tasar cocoon cultivation
- b) Tasar cocoon plantation in a mixed plantation of Arjuna and Ber
- c) Selling the cocoons after processing instead of selling them without processing in order to increase the income of the group

The following suggestions were made on behalf of the MGNREGS Cell:

- a) Wealth creation
- b) Rainwater harvesting
- c) Instituting a minor irrigation system
- d) Creating nursery through land improvement

SRD Cell emphasized on:

- α) Land improvement
- β) Micro-planning
- χ) NR-based micro-enterprise run by groups

In case of livestock, the following points were highlighted:

- a) Rearing small ruminants instead of cattle
- b) Rearing small birds
- c) Developing sources for local NR-based feed
- d) Organise seasonal vaccination camps to protect animals and birds from infections and diseases
- e) Adding major importance on cultivation of fodder in order to reduce market dependence of the farmer
- f) Using local herbs for health care of animals and birds
- g) Documentation and application of local practices

During the Detailed Project Report (DPR) stage, it is proposed to hold separate meetings with different groups especially marginalised and vulnerable groups such as women, girls, the elderly, indigenous people (if any), tribal groups, displaced people, refugees, disabled etc. The final project documentation will address as many of these groups as possible, highlighting those most affected, and the mitigation measures that are proposed through the project. Besides, one workshop in each of the two districts with the participation of all stakeholders from all targeted villages as well as the local community based organisations is also proposed to be organized.

I. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

Component 1- Community Exercises for Participatory Vulnerability and Capacity Assessments (PVCA) and making Land & Water use master plan (LUP & WUMP) with feedback from PVCA

Baseline without Adaptation fund

In the project villages, farm families are highly exposed to climate change related livelihood insecurity with no definite clue to the reasons or the solutions. Vulnerability and capacity assessment was never done on behalf of neither PRI nor NGOs operating in the area. LUP & WUMP for the area is not available with the Panchayat or any other Govt. dept. Thus Panchayat, MGNREGS Cell and individual households excavate water harvesting structures haphazardly without any consideration for the gradient of land or underground aquifers leading to dried up wells and ponds in most of the year.

With Adaptation Fund Support

The project has been designed to start with vulnerability capacity assessment in participatory way so that all the target households as well as the Panchayat and government line departments have reasonable understanding of climate change related impact on their life & livelihood and solutions. They will be able to map the available resources in the villages which will help them to combat with the climate exposure. The beneficiary families will be able to understand the benefits of interventions derived on the basis of WUMP and LUP who will later place it before PRI through Gram Sabhas for inclusion in Village Development Plan also.

Component 2 : Reducing climate risks through timely and appropriate early warning in local language

Baseline without Adaptation fund

Weather information is not sufficient and effective as information is given just before the incident happens, so most of the time the livestock, food stock and crops cannot be saved and the warning doesn't reach the interior. The system of warning, as it is now, works through a top-down way coming from district via block, police department and Panchayat, often lack the need for immediacy.

With Adaptation fund support

The system which will be promoted through this project intervention, will be locally generated, monitored and transferred. We will be establishing weather stations at high spatial resolution for weather data collection at village level, analysis by nearby Agriculture University and forecasting the same to alert the farming community on weather related risks is very important in helping farmers to make critical farming decisions for efficient crop management practices. Weather

forecast is also one of the vital parameters for gaining maximum /optimal production of fish and fish seed. This will ensure effective outreach for advisory to farmers on various aspects of agriculture including setting up systems to access on time weather and 7 days forecast and long term forecast, forecasting on climate (7days forecast, advent of monsoon and projections on rainfall and temperature for the entire cropping season- on choice of cultivar, time of cropping, likely crop diversification, type, method, time and quantity of farm inputs). This will also promote use of technologies like internet and mobile telephone.

Component 3 : Sustainable Resilient Technology Transfer for enhancing the adaptive capacity of the community

Baseline without Adaptation fund

In rain-fed farming areas, rice can only be cultivated during the major cropping season that is mid June – September, which depends on the quantity and temporal spread of rainfall. In the next season, which is winter season from October to February, other field crops (wheat, mustard etc) could be cultivated depending on water storage in village reservoirs, surface water and ground water availability. Cropping intensity in rain-fed farming areas and minor irrigated areas remain very low which indicated that even one full season cannot be supported under current climatic uncertainties. The winter season in most rain-fed areas mean that farmers have to migrate out looking for employment or that they undergo severe food and livelihood insecurity and also they become deprived from social and cultural events which is very crucial for backward community. This is the main reason that keeps these families entrenched in poverty.

Without secure livelihood, many rain-fed farming household engage in environment damaging practices- such as felling trees, stone quarrying etc. These practices erode soil (mostly topsoil), cause downstream siltation, damage to irrigation structures, reduction in water yield and storage in village reservoirs and, in turn, damage the ecosystem and livelihood assets that farmers depend so greatly.

Without the project, and its package of grassroots interventions these farm families will continue to face aggravated livelihood and food insecurity. Climate variability has increased livelihood insecurity of these communities. The shifting of rainfall pattern has a direct impact on rain-fed farming practice and storage in small reservoirs. In many cases, farmers are unable to cultivate the major season fully, leaving them bereft of the staple food crop. Longer periods of seasonal drought and intense rainfall, erodes the existing natural resource base on which farm livelihood is hinged- water and soil. There is a discernible worsening of the baseline situation due to climate variability and its associated impacts.

The poor families completely depend on forest and different areas (road side, canal side, personal area) for collecting fire woods. This is quite evident that excessive pressure is there on the forests and therefore deforestation is increasing rapidly. The work of firewood collection is mainly done by the children and women members of the families.

With Adaptation fund support

Soil and water conservation measures will be promoted to store the rainwater, reduce the soil erosion (top soil) through checking the run-offs. The stored water will be able to increase the certainty of rainfed crop (mostly paddy).

The availability of food, fodder, fuel wood will also be increased through plantations (social forestry, orchard plantation, sericulture). The livelihood opportunities will also be created. During climatic stress period or extreme drought situation, the families will be able to harvest from these community based assets (social forestry and orchard plantation sites). These assets will serve as capital for future.

Sustainable agriculture practices will be promoted which will help the farmers to integrate different subsystems (inter and intra) to increase the total varied production and productivity. The mono cropping will be replaced by mix cropping which will help to reduce the climate risk. Drought tolerant, nutritive crops will be cultivated on the permanent and/or seasonal fallows and backyard garden which in one hand will add to the total production and on the other hand it will help the families to have a balanced nutritious diet. Therefore the food and nutritional security will be enhanced. Seed savings both at individual and at community level will be encouraged which will help the farmers to become self reliant and the dependency on market will get reduced. Even during the erratic situation farmers will be able to sow the seeds for multiple times.

In the semi arid region, livestock rearing will play an important role as part of the livelihood of the poor families. The project will support rearing of small ruminants and birds who have capacity to tolerate extreme climatic stress. Aquaculture will also be promoted as an income generation activity for the families.

Energy efficient models, like installation of improved smokeless ovens, biogas, gasifier will be ensured through this project. These will help to save at least Rs. 5000 annual expenses incurred for kerosene, firewood, cow dung cakes and coal. Thereby the pressure on natural resources will be reduced, deforestation will be reduced and ultimately this will contribute in reduction in green house gas emission. The drudgery of women will also be addressed through support of low cost water filter, community based rainwater harvesting etc. The water borne diseases will be reduced especially in dry situations.

Component 4 : Advocacy for influencing government policy through promotion of best practices and realization of WUMP & LUP

Baseline without Adaptation fund

Climate change impacts are manifested locally. While climate change is broadly understood as an increase in global mean temperature leading to changes in regional climate patterns, it appears locally as, hotter days, more intense storms, less rainfall, or changes in the onset and length of growing seasons which are captured in PVCA. These climatic changes in turn affect local livelihood activities and economic enterprises. For translating national and state policies into action, especially at panchayet level, and decentralizing SAPCC objectives into local context, the role of planning and taking it to local level planning of Gram Sansad / Panchayat are very important. Currently the local level planning is not considering climatic threats in to consideration. The awareness regarding the consequences of climate change on their life and livelihood is not there.

With Adaptation Fund

The exercises (PVCA, WUMP, LUP) have an empowering effect by reinforcing people's capacity for collective action, enabling communities to understand the risks they face and identifying opportunities available to manage those risks.

The project will take necessary steps so that access of learning outcomes in the targeted villages as well as public domain is ensured through film, dedicated website and other printed materials used in farmers' fairs, environment education classes/events in schools targeting direct beneficiary families and indirect beneficiaries as well. The networks and partnerships will be built with like-minded organisations, POs, CBOs, PRIs, local administration, climate activists/experts etc. The schools will be motivated to develop eco-clubs / groups and teachers' network. The project also has the scope to aware the school children regarding our environment and climate change and popularise the best practices through eco-clubs/groups/teachers, climate volunteers etc.

J. Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project / programme.

The project will take a livelihood based approach to adaptation developing key community assets such as; knowledge, human capacity, physical and natural resource assets, social and financial capital. Project impacts will positively influence level of awareness, preparedness, production volumes, income generation, and service delivery in order to build capacity to adapt at household and community level. The intention is to create several options of adaptive livelihood opportunities for each family so that failure of one activity does not impact the family heavily and push towards the vicious cycle of climate variability driven poverty.

It is also envisaged that the project results will be able to influence the Government to further invest in the adjacent areas. Gradually on the basis of the activities people's institution (cooperatives/producers company/farmer's clubs) will be built to sustain each of the adaptation activities. The convergence with various government schemes and services will ultimately help to sustain and replicate the activities easily.

Expected Concrete Outputs	Sustainability measure	Government bodies to be attached
PVCA done for working villages in 2 districts LUP & WUMPs are prepared clubbing 2-3 contiguous villages together, wherever necessary.	Survey and mapping land plots will be done together with the PRI institute and Local MGNREGA cell. This ensures institutionalized capacity for this methodology.	MGNREGA Cell PRI systems Ministry of Agriculture P & RD Watershed management
Weather stations & Climate Resource Centres (CRCs) in 5 locations and weather kiosks in all working villages established for providing early warning and livelihood related advice through SMS	Weather information dissemination would be closely linked with the national technical partner agencies. The group of local resource person will ensure to continue the activities beyond project period and will be established as a self-functioning and self-sustaining body.	National Disaster Management Authority (NDMA) State Disaster Management Authority (SDMA) PRI systems Ministry of Agriculture P & RD
Sustainable soil and water conservation measures introduced for improvement of production and productivity.	.Proper repair and maintenance of the structures created under the project by project beneficiaries as well as community	MoA Soil Conservation Dept
Integrated farms applying sustainable agriculture techniques and practices with low input demanding and high tolerance crops, trees, livestock, backyard poultry, and aquatic components.	Direct involvement of Agriculture Department and its extension services ensures that farmer field trials are replicated in similar agro-eco zones. If technology and extension services are available, the level of adoption will be high among farm families.	MoA MoEF P&RD Livestock and fisheries
Disaster-proofing measures like community grain banks, seed banks of local seeds, fodder banks developed in targeted villages	Community organizations and Gram Panchayat to take care of the systems created	Gram Panchayat Community organizations
Appropriate technologies like energy efficient ovens, biogas, low cost water harvesting, low cost water filter, community water filter, alternative fuels from waste/weeds,	Awareness of beneficiaries and community organizations with the help of Govt Departments like MSME, MNNRE etc is expected to take care of sustainability	MSME MNRE

Expected Concrete Outputs	Sustainability measure	Government bodies to be attached
Access of learning outcomes in the targeted villages as well as public domain ensured through film, dedicated website and other printed materials used in farmers' fairs, environment education classes/events in schools targeting direct beneficiary families and indirect beneficiaries as well.	Media exposure and field visits to project sites would bring about longer term coverage. The exchange visits would spur replication interest in other communities. The case studies and policy briefings would enable MoA, MoEF and Department of National Planning to better target policy and development interventions	MoA MoEF P&RD NDMA SDMA
Networks and partnerships built with like-minded organizations, POs, CBOs, PRIs, local administration, climate activists/experts etc		Ministry of Rural Development (district agencies like DRDA)

Replication and scaling up of the project would be ensured through the following means:

- 1) In West Bengal, a 4-tier government system is in vogue. The State Govt., District Administration (Zilla Parishad), block level administration (Panchayat Samiti) and Village level administration (Gram Panchayat). Funds are allotted by the Central Govt. and State Govt. and it reaches the to the grass root level people through the 3-tier local governance system. At the village level, people take part in Gram Sansad (Gram Panchayat) meetings to voice their opinions about the development of the village. Their suggestions reach the Gram Panchayat where these are clubbed together to frame the Village Development Plan. Our Land Use Plan and Water Use Master Plan will be part of the Village Development Plan which then will be merged with mainstream and easily be scaled up in other non-project villages as well.
- 2) The various models proposed in the project after its successful completion can be replicable models for other area of lateritic zone.
- 3) The per beneficiary cost under the project works out to USD 467, which is comparable with norms under state government programmes.
- 4) To popularise the models, various state level and national levels various seminars and workshops will be organized for cross learnings, sharing of experiences and influencing policy decisions which in turn will help in scaling of the models established through the project

K. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme.

Check-list of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law	The project complies with Environment (Protection) Act, 1986 and Forest Conservation Act, 1980.	None
Access and Equity	The project provides fair and equitable access to the project beneficiaries and will not be impeding access to any of the other requirements like health clean water, sanitation, energy, education, housing, safe and decent working conditions and land rights.	None
Marginalized and Vulnerable Groups	The project is basically aimed at providing livelihood and income to marginalised community living in the project area and as such will not have any adverse impact on other marginalised and vulnerable groups	None
Human Rights	The project does not foresee any violation of human rights	None
Gender Equity and Women's Empowerment	The project will ensure participation by women fully and equitably, receive comparable socio-economic benefits and ensure that they do not suffer adverse effect.	None
Core Labour Rights	Payments to labor under the project will be made as per Government approved norms duly following minimum wage rate and hence ensuring core labor rights.	None
Indigenous Peoples	Not applicable to this project	None
Involuntary Resettlement	The project does not displace any community and hence issue of resettlement	NIL
<i>Protection of Natural Habitats</i>	The project does not affect any of the natural habitats.	NIL
Conservation of Biological Diversity	The project does not affect biodiversity in any adverse way.	NIL
Climate Change	The project is basically for enhancing the adaptive capacity and is not expected to contribute to GHG emissions	NIL
Pollution Prevention and Resource Efficiency	Many activities suggested in the project will prevent pollution and improve efficiency of resource use.	NIL
Public Health	No adverse impact on public health related issues is envisaged.	None
Physical and Cultural Heritage	No adverse impact on cultural heritage related issues is identified	None

Lands and Soil Conservation	Many activities proposed in the project will result in land and soil conservation. The project will not create any damage to land & soil resources.	None
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The AFB's Environmental and Social Policy (approved in November 2013) will be made available to project stakeholders and promoted through training and dialogue with implementing agencies to build a common understanding of the principles and practices that have been adopted to enhance development benefits and avoid unnecessary harm to the environment and affected communities. Any potential impacts on marginalized and vulnerable groups will be properly screened and considered by the implementing agencies.

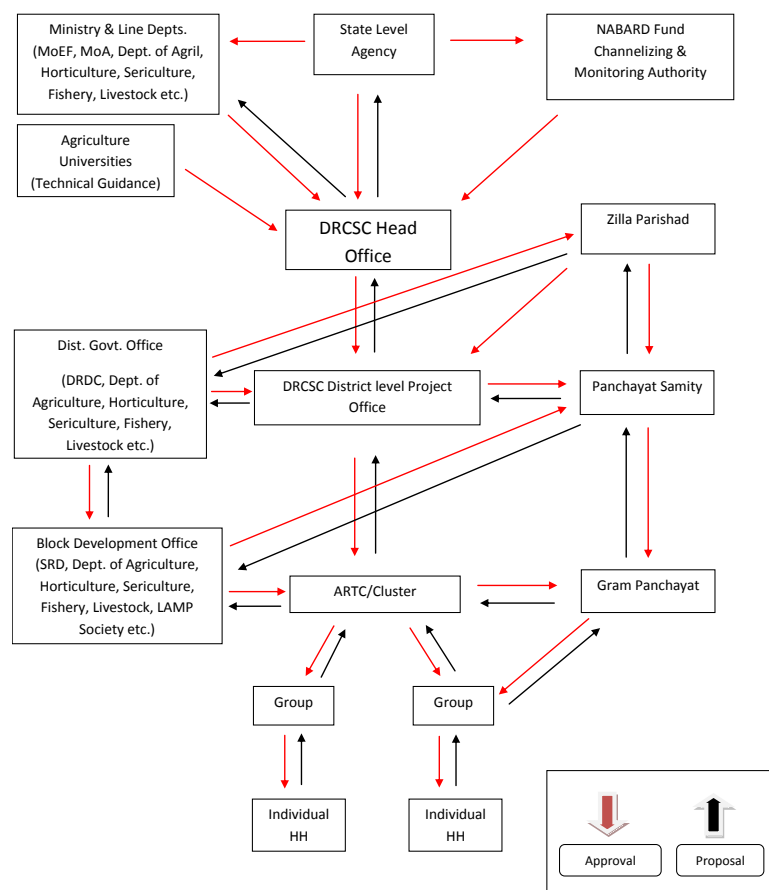
PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

The proposed project will be implemented by DRCSC through its local partner in Purulia district. DRCSC will have direct intervention in implementing the project in Bankura district. Two Project Coordinators with team of staff members will be appointed to manage the project under the overall technical and management guidance of the Climate experts. The Panchayats, blocks, will be engaged at the time of area selection, prioritising the problems and for overall monitoring.

Convergence activities are planned with various Block Government Departments [ADA, Agriculture Dept., Soil & Water Conservation, Fishery Extension Dept., Livestock Dept., Sericulture Dept. MGNREGS Cell, LAMP (Large Adivasi Multipurpose Product) Society] and District Horticulture Dept., SRD (Strengthening of Rural Development) as per the need of the project. Consultants and experts will be engaged for better implementation of activities. Liaison and experience sharing with the other SHGs of project area and organizations (regarding models developed by them) will be a major part under the project.

IMPLEMENTATION FLOW CHART



B. Describe the measures for financial and project / programme risk management.

Following are few risks associated the project.

Risk	Risk Perception	Response Measure
Village Institutions are not sustainable. Groups have been formed but due to difference in economic, social status they are not effective. Priority is given on working with individuals.	Low	The project has been designed in such a way that more stress will be given towards strengthening of the groups. The quality of the leadership would be made better, so that they themselves will be able to resolve the social conflicts.
Lack of awareness among participating communities and local officials on CC and potential impacts	Low	The project aims at working with both the community and the officials. Various awareness and sensitization sessions will be carried out.
Local (District and Block) Government in project implementation areas fail to prioritize climate change policies in their strategies and plans.	Medium	Climate change adaptation needs and priorities are reflected in State, National policies and plans, but a void remains at Gram Panchayat and block level. The implementation plan will be in line with national and state programmes therefore we will be advocating for inclusion of our best practices in future planning.
Policy makers and politicians prioritize economic benefits over sustainable and resilient ecosystems.	Low	The project will demonstrate cost-effective and economically sound models of adaptation and generate local demand, through communication strategies, to influence policy
Additional development (financial and marketing) support for alternate food and livelihoods are unavailable in the target Gram Panchayats at the required time	Low	The project has been designed to provide technology and inputs for such climate-resilient livelihoods, in line with the government's national programs for food security, poverty alleviation and village development. All these programs are active in the project areas, further liaison will be made between regular development programs and project objectives.

C. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

Monitoring components

Log frame: The basic document for every kind of Monitoring is the Project log frame, which should reflect already at proposal stage impact orientation. Ideally the log frame is cross-checked through impact/result chains at the proposal stage.

Baseline survey: WUMP and LUP will act as a baseline to the project as well as a planning document. The progress of the project can be tracked through tracking WUMP and LUP by the community itself. Some of the tools of WUMP and LUP will be repeated time to time by the community to understand the progress, learning outcome and way forward.

Monitoring plan, visits and reports: In order to ensure accountability and transparency a monitoring plan is developed at the beginning of the project by the responsible Programme Manager/Project coordinator.

Community planning and monitoring: Transparency must be not only ensured towards donors but also towards the target groups. The inclusion of the target groups in planning and monitoring of a project form a non-negotiable component. The project design itself with PVCA, WUMP and LUP ensure community participation from the beginning. The monitoring strategy details are presented in the table below:

Type of M&E Activity	Responsible Parties	Time Frame
Project Inception Workshop	Project Director/State NABARD	Within first three months
Inception Report	Project Director/ District level Project coordinator	One Month after IW
Biannual report	Project Director/ District level Project coordinator	End of every six months
Annual report	Project Director/ District level Project coordinator	End of each year
Project review & monitoring Meeting	Representatives of MOE/ Dept. of Govt. /Project Director/NABARD	First after IW (Inception workshop)
Mid-term evaluation	External Evaluator/Representatives of MOE/ Dept. of Govt. / Technical Consultants/ Project Director	At mid-point of project execution
End term evaluation	External Evaluator/Representatives of MOE/ Dept. of Govt. / Technical Consultants/ Project Director	At end of Project cycle
Final Report	Project Director/ District level Project coordinator	After end of the Project

NABARD will do the overall monitoring and district officials will closely monitor the programme.

The project coordinators and senior management of DRCSC along with the management personnel of local partners will be responsible to monitor the programme on annual basis. The district level workshops will be conducted to review the programme and make necessary action

plan for the next phase. Local administration representatives District Manager, ADO, BDO, Panchayat Pradhan, NABARD will be engaged in reviewing the programme followed by the Field Visits.

For the monitoring of an adaptation project, the link to climate change needs to be monitored in addition to the output, use of output and outcomes. The adaptation hypothesis that explains how project activities address climate risks should therefore be part of the monitoring framework and be referred to throughout the monitoring phase. In addition, it should be explained how any one activity reduces or prepares for climate risks, or how activities enhance adaptive capacities.

D. Include a results framework for the project proposal, including milestones, targets and indicators.

Goal	Developing climate adaptive and resilient livelihood systems through diversification, technology adoption and natural resource management for rural small and marginal farmers associated with agriculture and allied sector in Lateritic, Coastal and Alluvial Zone of West Bengal.				
	Indicator	Baseline	Target	Means of Verification	Risks and Assumptions
Objective: To enhance adaptive capacity of climate vulnerable families in semi-arid regions of Purulia and Bankura districts of West Bengal by introducing measures to tide over the effects of climate change induced rainfall variability and its impacts on their food and livelihood security.	Percentage of target population adopting risk reduction measures	Less than 5% of target 5000 households practice climate risk reduction measures	80% of target 5000 households practice at least one climate risk reduction measure introduced through project interventions such as: a. Responding to early warning and forecasting b. Introducing Integrated Farming Systems, Nutrition Gardens, Livestock etc. to increase food and income of individual households c. Soil and water conservation measures d. Post-harvest processing of food and non-timber forest products e. Introducing	Household survey at the start and end of project	Climate risk information and livelihood demonstrations convince farm families of the need to and possibility of adaptation at household and community level

			resistant crop varieties f. Increasing awareness and knowledge of climate risks and adaptation strategies		
	No. of families making use of low-cost alternative energy models	Less than 1% of the beneficiary households are aware or make use of alternative energy models	At least 80% of the targeted families make use of alternative energy models and are aware of its impact on environment	Household survey before and after the project	Beneficiaries are convinced about the benefits of using alternative energy models without consideration of traditional social or religious taboos.
Outcome 1 Communities develop protocol for collective management and regulating entitlements for equitable access and use of water through short term, long term and micro-watershed level understanding of climate change related impact and solutions merged with scientific knowledge.	No of beneficiaries with reasonable understanding of climate change related impact on their life & livelihood and solutions Percentage of target households with year round access to water sources for use in agriculture, livestock rearing and household purposes.	Farm families highly exposed to climate change related livelihood insecurity with more than 90 % of the families having no definite clue to the reasons or the solutions Panchayat, MGNREGS Cell and individual households excavate water harvesting structures haphazardly without any consideration for the gradient of land or underground aquifers leading to dried up wells and ponds in most of the year.	At least 80% of 5000 target households as well as the Panchayat and responsible officials have reasonable understanding of climate change related impact on their life & livelihood and solutions Availability of water for use in agriculture, livestock rearing, household purposes in the area is increased.	Household survey at the beginning and end of the project.	Water Use Management Plan and Land Use Plans accepted by PRI through Gram Savas and most of the work is supported through convergence of various schemes.
<i>Output 1.1</i>	LUP & WUMPs	LUP & WUMP for	At least 80% of	WUMP &	Community

LUP & WUMPs prepared clubbing 2~3 contiguous villages together, wherever necessary.	covering the targeted 90 villages in place	the area is not available with the Panchayat or any other Govt. dept.	targeted families understand the benefits of interventions derived on the basis of WUMP and LUP who place it before PRI through Gram Sabhas for inclusion in Village Development Plan and most of the work is supported through convergence of various schemes.	LUPs for the target area Copies of Village Development Plan (VDP) available with Panchayat	has unanimous acceptance and sizeable participation in the Gram Sabhas to influence PRI in accepting their proposals to be included in VDP
Outcome 2 Farmers and other natural resource dependent communities are better prepared for hazards/climatic vagaries.	Percentage of target population(Gender Disaggregated) having ready access to and making use of weather data for appropriate responsive adaptive actions to safeguard livelihood assets from climate risks and hazards No. of training sessions conducted for farmer groups No. of training sessions arranged for officials	Weather data generated in cities are far off from the target area & therefore has practically no bearing on the actual weather situation in the area. In case of natural disasters or delayed monsoon, weather warnings are usually late in reaching the community.	All Farmer Groups in target area receive information and tools to develop local adaptive strategies to safeguard livelihood assets. All local and divisional-level officials engaged in agriculture, fisheries, forestry and disaster management receive at least one training on supporting adaptive strategies.	End of project survey of households Final Project Evaluation Feedback reports of officials received training/TOT	Demand for climate change awareness and adaptive strategies among communities Capacity and motivation of local service delivery to implement and monitor adaptive actions
<i>Output 2.1</i> Establishment of Low-cost Weather stations, Climate Resource Centres (CRCs) and Weather Kiosks	Weather stations & Climate Resource Centres in place. Weather kiosks covering all working villages.	Except state-level and country-level weather reports in radio and telemedia, no source of local weather information available in the target zone	Weather stations & Climate Resource Centres (CRCs) in 2 locations (1 in each of the 2 target districts) and weather kiosks in all working villages established for providing early warning and livelihood related	Physical visit to Weather Stations, Climate Resource Centres and Weather Kiosks Household survey to understand the reach of the weather	Community shows interest in making use of weather data to ward off climate risks impacting their livelihood

			advice through SMS	data and the extent of measures taken to avoid climate risks and hazards	
<p><i>Output 2.2</i></p> <p>Groups of local resource persons (climate volunteers) and Early Warning Committees organized Direct involvement of Agriculture Department and its extension services ensures that farmer field trials are replicated in similar agro-eco zones If technology and extension services are available, the level of adoption will be high among farm families If technology and extension services are established through project and marketing avenues and micro finance are available by networking, the level of adoption will be high among farm women. MoA MoEF P&RD Livestock and fisheries MSME, MoA MoEF P&RD Livestock and fisheries Media exposure and field visits to project sites would bring about longer term coverage. The exchange visits would spur replication interest</p>	No. of climate volunteer groups and Early Warning Committees	Except for Panchayat-level Village Disaster Committees that are mostly non-functioning, no other village-level communication channel exists for providing or analyzing local-level weather data	Climate Volunteer Groups and Early Warning Committees established in all working villages	Minute books of Climate Volunteer Groups and Early Warning Committees	Timely meteorological information generated and disseminated. Households ready to modify behavior and livelihood practices according to forecast/warning.

in other communities. The case studies and policy briefings would enable MoA, MoEF and Department of National Planning to better target policy and development interventions MoA MoEF P&RD NDMA SDMA Ministry of Rural Development (district agencies like DRDA) for analyzing the forecast and preparing / disseminating targeted livelihood related advice.					
Outcome 3 Climate risks on livelihoods reduced and annual production stabilized through introduction of natural resource based diversified and integrated alternative production systems.	Percentage of target households with sustained climate resilient livelihoods No. of women with new source of income	Most Farm families under Minor irrigation/rainfed conditions highly exposed to climate change related livelihood insecurity Women in target areas practice tradition rain fed farming	All 5000 target households have developed at least one climate resilient livelihood strategy or alternate source of income Home gardens generate income in 80% of target population Women's contribution to household income increased by 50% in target households	Field monitoring reports of End of project survey	Selected livelihood options are complimentary to state and other development interventions in identified districts. Access to financing and markets for better livelihood targeting
<i>Output 3.1</i> Sustainable soil and water conservation measures introduced for improvement of	No. of families benefited by soil-water conservation structures Area of fallow land brought under	Low water retention capacity of the soil, fertile top soil erosion with run off	300 hectares of fallow land brought under cultivation 400 hectares of single crop land	SW Conservation structures, Master Roll, Group Records, Internal &	PRIs agree to include SW conservation structures in Village Developme

production and productivity.	cultivation Area of single-crop land turned into double crop	Large area lying fallow	turned into at least double crop	External Evaluation Reports, Project Progress Report	nt Plan through convergence with mainstream schemes
<p><i>Output 3.2</i> (a) Integrated farms applying sustainable agriculture techniques and practices with low input demanding and high tolerance crops, trees, livestock, backyard poultry, aquatic components and bio-digesters popularized</p> <p>(b) Disaster-proofing measures like community grain banks, seed banks of local seeds, fodder banks developed in targeted villages</p>	<p>No. of households making integrated farms</p> <p>No. of trainees from among beneficiary households attending training on sustainable agriculture techniques and practices</p> <p>No. of Grain Banks, Seed Banks and Fodder Banks established</p> <p>No. of families whose annual income and food consumption have increased</p>	<p>Integrated Farming System is practised by 10 farmers in the target area.</p> <p>20 out of 5000 target families have knowledge about sustainable agriculture techniques and practices</p> <p>18 no. of Grain Banks, 1 no. of Seed Bank and no Fodder Banks exist in the area.</p>	<p>100 nos. of Integrated Farms is established.</p> <p>At least 85% of the targeted families receive training on sustainable agriculture techniques and practices</p> <p>40 nos. of Grain Banks, 5 nos. of Seed Banks and 5 nos. of Fodder Banks are established in the area.</p> <p>At least 2000 no. of target families enjoy an increase in income from sale of farm produce</p> <p>Food availability round the year is increased in at least 4000 no. of target families</p>	<p>Household level survey before and after the project</p> <p>Periodic monitoring report</p>	<p>Community shows eagerness to attend training and replace conventional agriculture with sustainable agriculture</p>
<p><i>Output 3.3</i> Appropriate technologies like energy efficient ovens, biogas, low cost water harvesting, low cost water filter, community water filter, etc. promoted & popularized and linkages with mainstream</p>	<p>No. of target families using energy efficient ovens, biogas, low cost water harvesting, low cost water filters, alternative fuels from waste/weeds</p> <p>No. of community water filters established</p>	<p>450nos. of target families use energy efficient ovens. 100 families have biogas units. 110 low cost water filters are in use.</p> <p>No community-based drinking water facility installed</p>	<p>At least 2400 nos. of target families use energy efficient ovens, 250 biogas, 2500 low cost water filters</p> <p>At least 5 no. of community based drinking water facilities are established</p>	<p>Household and village survey before and after the project</p> <p>Periodic monitoring report</p>	<p>Community eagerness to make use of climate adaptive structures and maintain them</p> <p>PRIs show promptness</p>

schemes established for climate adaptation and also mitigation to a certain extent	No. of target families accessing mainstream schemes for installation of climate adaptive structures	1000 no. of target families access mainstream schemes for installation of climate adaptive structures	At least 6000 no. of target families accessing mainstream schemes for installation of climate adaptive structures		to help the beneficiaries in accessing mainstream schemes
Outcome 4 Awareness regarding climate change and its impacts is improved and climate resilience practices gain popularity not only in the targeted area, but also at local, state and national level.	Govt. adopted the climate resilient models in their policies The works are being replicated in neighboring villages along with the project area by farmers own initiatives	Only few farmers are practicing climate resilient livelihood measures in the projected villages.	Climate resilient livelihood strategies adopted by other Gram Panchayats and Blocks	Govt. document Interaction with the community Physical verification External evaluation report	Govt. policies remain unchanged Political disturbance doesn't occur
Output 4.1 Community trained to analyse WUMP and LUP to suggest interventions in the Gram Sabhas.	Community has knowledge to analyse WUMP and LUP to suggest interventions to avoid climate risks affecting livelihood	Community has no idea about WUMP and LUP	At least in 50% cases, intervention plans made on the basis of WUMPs and LUPs recommended by the Gram Sabha are included in Village Development Plans through convergence of mainstream schemes	Minutes of Gram Sabha meetings Copies of resolutions for development of Village Development Plans	Community shows interest in attending training and participating in Gram Sabhas
Output 4.2 Access of learning outcomes in the targeted villages as well as public domain ensured through film, dedicated website and other printed materials used in farmers' fairs, environment education classes/events in schools targeting direct beneficiary families and indirect beneficiaries as well.	Nos. of public education materials No. of school encouraging the Environment education	No such primary school where students are taught regarding environment. IEC materials not available	10 Nos. of primary school encouraging environment education 2Nos. AV materials developed Climate Change related IEC materials would be published 4Nos. exhibition cum farmers fair would be done Regular up gradation of website	No. of IEC materials(printed & AV) Course curriculum School register Feedback of parents Photographs Project progress report	School Managing committee continue their support Parents' motivation will remain same

Output 4.3 Networks and partnerships built with like-minded organizations, POs, CBOs, PRIs, local administration, climate activists/experts etc.	Network formed Capacity build up to deal with different stakeholders	No such network events in the project area No such capacity building initiatives in the project area	500 nos. capacity building events (training, workshop) will be done for the CBO, NGO, POS, PRIs	Records of network Report of training & workshop, photos, Project progress report	No conflict among the network members No change in the PRI
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E. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund

Project Objective(s) ⁷	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
To enhance adaptive capacity of climate vulnerable families in semi-arid regions of Purulia and Bankura districts of West Bengal by introducing measures to tide over the effects of climate change induced rainfall variability and its impacts on their food and livelihood security.	Percentage of target population adopting risk reduction measures	Communities develop protocol for collective management and regulating entitlements for equitable access and use of water through short term, long term and micro-watershed level understanding of climate change related impact and solutions merged with scientific knowledge. Farmers and other natural resource dependent communities are better prepared for hazards/climatic vagaries. Climate risks on livelihoods reduced and annual production stabilized through introduction of natural resource based diversified and integrated alternative production systems. Awareness regarding climate change and its impacts is improved and climate resilience practices	80% of target 5000 households practice at least one climate risk reduction measure introduced through project interventions such as: a. Responding to early warning and forecasting b. Introducing Integrated Farming Systems, Nutrition Gardens, Livestock etc. to increase food and income of individual households c. Soil and water conservation measures d. Post-harvest processing of food and non-timber forest products e. Introducing resistant crop varieties f. Increasing awareness and knowledge of climate risks and adaptation strategies	1914808

⁷ The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

		gain popularity not only in the targeted area, but also at local, state and national level.		
	No. of families making use of low-cost alternative energy models		At least 80% of the targeted families make use of alternative energy models and are aware of its impact on environment	198415
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
Communities develop protocol for collective management and regulating entitlements for equitable access and use of water through short term, long term and micro-watershed level understanding of climate change related impact and solutions merged with scientific knowledge.	Percentage of target households with year-round access to water sources for use in agriculture, livestock rearing and household purposes.	LUP & WUMPs prepared clubbing 2~3 contiguous villages together, wherever necessary.	Availability of water for use in agriculture, livestock rearing, household purposes in the area is increased.	85,824
Farmers and other natural resource dependent communities are better prepared for hazards/climatic vagaries.	Percentage of target population (Gender Disaggregated) having ready access to and making use of weather data for appropriate responsive adaptive actions to safeguard livelihood assets from climate risks and hazards	Establishment of Low-cost Weather stations, Climate Resource Centres (CRCs) and Weather Kiosks	All Farmer Groups in target area receive information and tools to develop local adaptive strategies to safeguard livelihood assets.	27167
	No. of training sessions conducted for farmer groups No. of training sessions arranged for officials	Groups of local resource persons (climate volunteers) and Early Warning Committees organized for analyzing the forecast and preparing / disseminating targeted livelihood related advice.	All local and divisional-level officials engaged in agriculture, fisheries, forestry and disaster management receive at least one training on supporting adaptive strategies.	
Climate risks on livelihoods reduced and annual production stabilized through introduction of natural resource based diversified and integrated alternative	Percentage of target households with sustained climate resilient livelihoods No. of women with new source	Sustainable soil and water conservation measures introduced for improvement of production and productivity. (a) Integrated farms applying sustainable	1000 hectares of single crop land turned into at least double crop All 12000 target households have developed at least one climate resilient	1,890,698

production systems.	of income	<p>agriculture techniques and practices with low input demanding and high tolerance crops, trees, livestock, backyard poultry, aquatic components and bio-digesters popularized (b) Disaster-proofing measures like community grain banks, seed banks of local seeds, fodder banks developed in targeted villages</p> <p>Appropriate technologies like energy efficient ovens, biogas, low cost water harvesting, low cost water filter, community water filter, alternative fuels from waste/weeds, solar charging station etc promoted & popularized and linkages with mainstream schemes established for climate adaptation and also mitigation to a certain extent</p>	<p>livelihood strategy or alternate source of income</p> <p>Home gardens generate income in 80% of target population</p> <p>Women's contribution to household income increased by 50% in target households</p>	
<p>Awareness regarding climate change and its impacts is improved and climate resilience practices gain popularity not only in the targeted area, but also at local, state and national level.</p>	<p>Govt. adopted the climate resilient models in their policies</p> <p>The works are being replicated in neighboring villages along with the project area by farmers own initiatives</p>	<p>Community trained to analyse WUMP and LUP to suggest interventions in the Gram Sabhas.</p> <p>Access of learning outcomes in the targeted villages as well as public domain ensured through film, dedicated website and other printed materials used in farmers' fairs, environment education classes/events in schools targeting direct beneficiary families and indirect beneficiaries as well.</p> <p>Networks and partnerships built with like-minded organizations, POs, CBOs, PRIs, local administration, climate activists/experts etc.</p>	<p>Climate resilient livelihood strategies adopted by other Gram Panchayats and Blocks</p>	109,534

F. Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

SI No	Sub Component	Descriptions	Unit cost	No. of units	Amount (USD)	Sub Component wise Total (USD)	Component wise Total (USD)
1	LUP & WUMPs are prepared clubbing 2~3 contiguous villages together, wherever necessary.	GIS Mapping	USD 3333/- for each GIS mapping	25	83325	85,824	85,824
		Gram Panchayat level planning	USD 833/- for each planning	3	2499		
2.1	Weather stations & Climate Resource Centres (CRCs) in 2 locations and weather kiosks in all working villages established for providing early warning and livelihood related advice through SMS	Establishment of local weather station	USD 4167/- per Station	2	8334	20500	27167
		Establishment CRC – Climate Resource Centre	USD 4083/- per CRC establishment	2	8166		
		Climate kiosk Centre	USD 200/- for each Kiosk centre	20	4000		
2.2	Groups of local resource persons (climate volunteers) and Early Warning Committee organized for analyzing the forecast and preparing / disseminating targeted livelihood related advice.	National level sites	USD 6667	1	6667	6,667	

SI No	Sub Component	Descriptions	Unit cost	No. of units	Amount (USD)	Sub Component wise Total (USD)	Component wise Total (USD)
3.1	Sustainable soil and water conservation measures introduced for improvement of production and productivity.	Step pond	USD 13333/- for each Pond excavation	40	533320	7,56,748	18,90,698
		Earthwork & Soil & water conservation	USD 200/- per ha	400	80000		
		Plantation	USD 417/- for each Plantation (ha)	280	116760		
		Check Dam	USD 6667 per Check dam	4	26668		
3.2 (a)	Integrated farms applying sustainable agriculture techniques and practices with low input demanding and high tolerance crops, trees, livestock, backyard poultry, aquatic components and bio-digesters popularized	Training	USD 333 per Training programme	80	26640	9,07,205	
		IFS	USD 500/- per IFS	100	50000		
		Inputs seeds/ Organic material	USD 192/- per hectare	1000	192000		
		Small bird & animals	USD 67/-	3200	214400		
		Micro irrigation facilities	USD 250/- per micro irrigation system	800	200000		
		Lift Irrigation	USD 8333/- per LI	5	41665		

SI No	Sub Component	Descriptions	Unit cost	No. of units	Amount (USD)	Sub Component wise Total (USD)	Component wise Total (USD)
		Production Organic manure	USD 83/- for each unit	2000	166000		
		Aquaculture	USD 33/-	500	16500		
3.2 (b)	Disaster-proofing measures like community grain banks, seed banks of local seeds, fodder banks developed in targeted villages	Community Grain bank	USD 500/- per Grain bank	40	20000	28,330	
		Community Seed bank	USD 833/- per Seed bank	5	4165		
		Community Fodder bank	USD 833/- per Fodder bank	5	4165		
3.3	Appropriate technologies like energy efficient ovens, biogas, low cost water harvesting, low cost water filter, community water filter, etc. promoted & popularized and linkages with mainstream schemes established for climate adaptation and also mitigation to a certain extent	Energy efficient ovens	USD 25/- per oven	2400	60000	1,98,415	
		Bio gas	USD 217/- per Bio-gas	250	54250		
		Low cost water filter	USD 17 /-per water filter	2500	42500		
		Community water filter	USD 8333/- for each water filter	5	41665		
4.1	At least in 50% cases, plans for WUMPs and LUPs recommended by the Gram Sabha	District level workshop	USD 1667/- cost per workshop	4	6668	7,868	1,09,534

SI No	Sub Component	Descriptions	Unit cost	No. of units	Amount (USD)	Sub Component wise Total (USD)	Component wise Total (USD)
	are included in Village Development Plans through convergence of mainstream schemes						
		Meeting with PRI & District level training	USD 20/- per meeting	60	1200		
4.2	Access of learning outcomes in the targeted villages as well as public domain ensured through film, dedicated website and other printed materials used in farmers' fairs, environment education classes/events in schools targeting direct beneficiary families and indirect beneficiaries as well.	Film	USD 5000/- per Film	2	10000	64,166	
		Website	USD 250/- per month	48	12000		
		Printing materials, Newsletter, Booklet	USD 6667/-	LS	6667		
		Farmers Fair	USD 5833/- per Fair	3	17499		
		Environment Education class	USD 3000/-	6	18000		
4.3	Networks and partnerships built with like-minded organizations, POs, CBOs, PRIs, local administration, climate activists	Capacity building of CBO, POS, NGO, PRI	USD 67/-	500	33500	37,500	

SI No	Sub Component	Description s	Unit cost	No. of units	Amount (USD)	Sub Component wise Total (USD)	Component wise Total (USD)
	/experts etc.						
		Network meeting	USD 250/- for each meeting	16	4000		
	TOTAL						21,13,223
	Project / Programme Execution Cost						2,21,830
	Total Project / Programme Cost						23,35,053
	Project/Programme Cycle Management						1,98,480
	Amount of Financing Requested						25,33,533

G. Include a disbursement schedule with time-bound milestones.

Component	Year1				Year 2				Year 3				Year 4			
	Qt 1	Qt 2	Qt 3	Qt 4	Qt 1	Qt 2	Qt 3	Qt 4	Qt 1	Qt 2	Qt 3	Qt 4	Qt 1	Qt 2	Qt 3	Qt 4
1. LUP & WUMPs are prepared clubbing 2~3 contiguous villages together, wherever necessary.	5%	15%	50%	100%												
2.1. Weather stations & Climate Resource Centres (CRCs) in 2 locations and weather kiosks in all working villages established for providing early warning and livelihood related advice through SMS			60%	100%												
2.2.Groups of local resource persons (climate volunteers) and Early Warning Committee organized for analyzing the forecast and preparing / disseminating targeted livelihood related advice		20%	50%	100%												
3.1 Sustainable soil and water conservation measures introduced for improvement of production and productivity.			5%	10%	20%	40%	45%	50%	60%	70%	80%	85%	90%	95%	100%	
3.2(a)Integrated farms applying sustainable agriculture techniques and practices with low input demanding and high tolerance crops, trees, livestock, backyard poultry, aquatic components and bio-digesters popularized	5%	15%	25%	30%	40%	50%	55%	60%	65%	75%	85%	90%	95%	100%		
3.2.(b) Disaster-proofing measures like community grain banks, seed banks of local seeds, fodder banks developed in targeted villages			25%	40%			60%	70%			85%	100%				
3.3. Appropriate technologies like energy efficient ovens, biogas, low cost water harvesting, low cost water filter, community water filter, etc promoted & popularized and linkages with mainstream schemes established for climate adaptation and also mitigation to a certain extent	nil	nil	5%	15%	20%	30%	40%	45%	50%	60%	70%	80%	100%			
4.1. At least in 50% cases, plans for WUMPs and LUPs recommended by the Gram Sabha are included in Village Development Plans through convergence of mainstream schemes	nil	10%	20%	25%	30%	35%	40%	45%	50%	55%	60%	80%	85%	90%	100%	
4.2. Access of learning outcomes in the targeted villages as well as public domain ensured through film, dedicated website and other printed materials used in farmers' fairs, environment education classes/events in schools	nil	5%	10%	25%	30%	35%	40%	50%	55%	60%	65%	75%	80%	85%	90%	100%
4.3. Networks and partnerships built with like-minded organisations, POs, CBOs, PRIs, local administration, climate activists/experts etc	nil	5%	10%	20%	25%	30%	35%	50%	55%	60%	65%	75%	85%	90%	95%	100%

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

- A. Record of endorsement on behalf of the government⁸** *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

Ravi Shankar Prasad, IAS, Joint Secretary, Ministry of Environment and Forest (MoEF), Government of India	Date: January, 07, 2014
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- B. Implementing Entity certification** *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (National Action Plan on Climate Change) and subject to the approval by the Adaptation Fund Board, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
(Dr. Venkatesh Tagat) Chief General Manager NABARD, Head Office, Mumbai (Implementing Entity Coordinator)	
Date: February, 10, 2014	Tel. and email: +91 22 2653 0174 +91 9820892803 venkatesh.tagat@nabard.org
Programme Contact Person: Shri. Sanjay Kumar Dora, DGM, NABARD, Head Office, Mumbai	
Tel. And Email: +91 22 2653 9640, +91 8450997360 Email: sk.dora@nabard.org , dora.sanjaykumar@gmail.com	

⁶. Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY


- A. Record of endorsement on behalf of the government²** *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

Ravi Shankar Prasad, IAS, Joint
Secretary, Ministry of Environment and
Forest (MoEF), Government of India

Date: February, 07, 2014

- B. Implementing Entity certification** *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (National Action Plan on Climate Change) and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.



(Dr. Venkatesh Tagat)
Chief General Manager
NABARD, Head Office, Mumbai
(Implementing Entity Coordinator)

Date: February, 10, 2014

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² Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

रवि एस. प्रसाद
आई.ए.एस.
संयुक्त सचिव
Ravi S. Prasad
I.A.S.
Joint Secretary



भारत सरकार
पर्यावरण एवं वन मंत्रालय
Government of India
Ministry of Environment and Forests

D.O. No.14/40/2013-CC

Dated: 7th February 2014

Subject: Endorsement for the proposal on "Enhancing Adaptive Capacity and increasing Resilience of Small and Marginal Farmers in Purulia and Bankura districts of West Bengal, India".

In my capacity as designated authority for the Adaptation Fund in India, I confirm that the above national project / programme proposal is in accordance with the government's National priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in India.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be coordinated and implemented by National Bank for Agriculture and Rural Development and executed by Development Research Communication and Services Centre (DSCRC).

Sincerely,

(Ravi S. Prasad)

The Adaptation Fund Board
C/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5



जहाँ है हरियाली /
वहाँ है खुशहाली //

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