GOVERNMENT OF KERALA
REBUILD KERALA INITIATIVE
1st Floor, North Block, Government Secretariat,
Thiruvananthapuram – 695001, Kerala
Phone: 04712517276, 2518946; email: rkisecretariat@kerala.gov.in

NOTICE

Reference No: RKI/NT/01/2019 **Dated 05/08/2019**

The Rebuild Kerala Development Programme (RKDP) has identified technical studies and assessments across various sectors to support the State's progress towards achieving its VISION of a green and resilient Kerala.

The Rebuild Kerala Initiative (RKI), in close collaboration with the different departments across sectors, is facilitating the engagement of competent and credible organizations to undertake the studies. As part of preparation of the Terms of Reference (ToR), we invite your observations on the scope of work outlined for the studies within the sectors of Agriculture, Animal Husbandry and Diary. The scope of work for the studies is hereby enclosed in the subsequent section. You are requested to send us your inputs at **rkisecretariat@gmail.com**, latest by **6 PM on 12th August, 2019.**

For further clarification, Shri. K.Sunil Kumar, Joint Secretary – RKI may be contacted at 9496154103 (Mob.).

Awaiting your valuable feedback,

Sincerely,

Sd/-

Dr. Venu V
Chief Executive Officer, RKI
Government of Kerala.

Agro-ecological zone-based evaluation of factors affecting productivity of various crops and preparation of probable best practice solutions

1. BACKGROUND: The Rebuild Kerala Initiative (RKI) and its sectoral priorities

The State of Kerala went through the worst-ever floods in history since 1924 between the period of June 1 and 19 August 2018. One-sixth of the State's population (about 5.4 million) were affected. The floods and the accompanying landslides were catastrophic in terms of loss of lives, livelihoods, property and infrastructure.

In its response to recover from flood devastation and to develop a green and resilient Kerala, the Government of Kerala developed an inclusive and comprehensive roadmap, which was transitioned into the Rebuild Kerala Initiative (RKI). The RKI's mandate is to develop, coordinate, facilitate and monitor the Rebuild Kerala Development Programme (RKDP) through a participatory and inclusive process.The RKDP encompasses crosscutting and sector-based policy, regulatory and institutional actions as well as priority investment programs that are critical for resilient and sustainable recovery and rebuilding of the State. It aims to catalyze the rebuilding of Kerala in a way that addresses the key drivers of floods and other natural disasters and climate change risks and strengthens preparedness against future disasters. Through the RKDP, the Government of Kerala (GoK) aims to ensure a resilient recovery and development pathway for a *Nava Keralam*.

The key responsibilities of the RKI include:

- Developing and coordinating the implementation of the RKDP;
- Facilitating transformative policy, institutional realignments and critical programme investments that address the fundamental drivers of floods and other natural disaster so that to better prepare Kerala for future disasters and climate change risks;
- Mobilizing public, private and community-based resources for the implementation of the RKDP;
- Supporting Government departments & agencies in effecting agreed policy and institutional changes, project preparation and implementation and, in select cases, directly undertake activities and projects that are critical for recovery and resilience;
- Entering into and enabling partnerships with nongovernmental and civil society entities, development partners, financing partners, the private sector, academia and think tanks for the implementation of the RKDP;
- Ensuring an inclusive, participatory and consultative process of implementation of the RKDP;
- Undertaking M&E and conducting performance review of RKDP; and
- Reporting to the High-level Empowered Committee (HLEC), the Advisory Council, the Chief Minister and the Council of Ministers on all matters pertaining to the RKDP, including Programme progress and results on a regular basis.

The agriculture sector was heavily affected during the floods. The mid-lands and low-lands (Kuttanad and Kole regions) witnessed massive flooding and inundation of fields, resulting in rotting of crops and wilting of trees, causing significant losses to farmers. Idukki district, which is characterized by hilly terrain of the Western Ghats, saw large tracts of agricultural land and plantation crops wiped out due to torrential rainfall and massive flow of water. Approximately 1.08 million farmer households have been affected by

the floods. The total cultivated area affected by floods is an estimated 236,650 ha, which is about 11% of the State's area under cultivation. The most affected crops are pepper (98,000 ha), cardamom (35,750 ha), paddy (35,820 ha), banana (21,620 ha), tapioca (12,100 ha) and vegetables (10,850 ha). Total crop losses are estimated at Rs. 18,545 crore, with the maximum losses in pepper, cardamom and banana crops.

The RKI and the Department of Agriculture, Government of Kerala shall work together, in coordination with other related stakeholders and agencies, to enable the following:-

- Developing sustainable, responsible, integrated, inclusive, eco-friendly, and resilient agriculture in line with the policies of Government of Kerala and Government of India.
- Implementation of an inclusive recovery strategy promoting the participation and well-being of women and other vulnerable groups in agriculture, fisheries, livestock, and allied activities.
- Reconstruction efforts in the agriculture sector, with special attention on increasing economic activity and sector resilience to disaster events, in accordance with the principles of 'Build Back Better (BBB)'.
- Short term recovery with focus on provision of inputs and restocking, replacement or repair of assets and infrastructure, and finding alternative income sources for the population.
- Medium- and long-term activities with focus on
    - Building resilience of each subsector through environmentally sustainable integrated farming systems,
    - Community-based management of water resources,
    - Promotion of traditional indigenous livestock breeds (resilient to local conditions)
    - Improvements in value chain, setting up of early warning systems, and effective communication with enhanced GIS/technology backed capabilities.
    - Agriculture development in tandem with effective and timely implementation of all developmental programs of local bodies, State and Central Government using modern scientific techniques and information technology.
    - Increasing awareness of modern farming techniques and technologies to farmers to cope with the vagaries of nature which is essential for the survival of the farming community.
    - Extension activities - restructured into Agro-ecological Management Units (AEMUs) having similar soil, climate and crop patterns; and the present Agriculture Technology Management Agency (ATMA) restructured to address the extension needs of the AEMUs.

2. CONTEXT: The rationale for the proposed study

To meet the above requirements and address the overarching challenges across various levels, a multi-pronged approach will be adopted, with focus on an archeological approach for sustainable and resilient agriculture, restoration of damaged soil, re-engineering institutional framework for effective last mile delivery, technological interventions for enhanced monitoring, building knowledge base, creation of enabling agribusiness environment, capacity building initiatives and access to institutional finance for value chain actors.

The Government of Kerala produced its first policy on agriculture in the year 1992. Subsequently, there have been a number of policies formulated – land related, water related, soil related, climate and environment related, policies related to watershed development approach, policies to alleviate farmer

distress, policies related to human resource development in farm sector, policies on technology application in agriculture, policies on international trade, policies on insurance and agricultural credit, etc. In the aftermath of the floods, the need to revisit and revamp these policies has emerged in order to strengthen their effectiveness in catering to the requirements of recovery and rebuilding of the agriculture sector of Kerala.

The major challenges observed in the State include limited capacity of grassroots institutions at Panchayat level especially the KrishiBhavans, a plethora of institutions focusing on only implementation of scheme rather than outcomes, institutions working in isolation with limited coordination, poor monitoring and oversight of many development programs, lack of updated technology such as ICT, MIS etc. across thespectrum in agriculture sector, ineffective irrigation systems, limited infrastructure and investment therein, unplanned cropping pattern in hilly areas (where top soil is prone to erosion), low awareness of farmers for crop insurance/financial products, declining productivity of various crops, and limited access to quality inputs. It is important to counter these challenges through facilitating customized and sustainable development of agro-ecological zones, restoration of damaged soil, re-engineering of institutional framework and align with requirement, developing climate smart agriculture, enhancing technological interventions, developing knowledge management aspects for effective investment and creation of enabling business environment to improve agri-business in the State.

In view of above, one of major investment planning exercise is proposed for strengthen value chain & implementing agro-marketing initiatives of key Kerala crops (including disaster resilient varieties) and increase private sector investment in sector.

In this context, it is required to conduct a detailed study on agro-ecological approaches that can drive Kerala's agricultural sector on the high growth path in future.

3. SCOPE OF WORK: An indicative list of the services to be performed within the proposed study

The broad scope of work shall include:-

- Review of crops (and varieties/hybrids therein) w.r.t. farmers practices;, their suitability for different agro ecological zones
- Analysis of productivity of crops grown in these zones and review of factors (agronomic, environmental, socio-economic and cultural) impacting the productivity of crops
- Prepare a strategic roadmap for sustainable and productive agro-ecology approach for the state including establishing an enabling policy and regulatory frameworks

Develop strategy and roadmap to expand awareness of crop insurance and improve uptake

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Under RKDP program, one of the priority area is Disaster Risk Management Financing, which include State Disaster Response Fund, State Disaster Mitigation Fund and State Disaster Risk Insurance Fund. One of the aim is to popularize existing crop insurance schemes (Nodal Department: Agriculture). Crop insurance / fishing insurance (for boat or other equipment's) scheme needs to be popularized and

incentivized asmany of the farmers lost crops and agriculture land during floods and other coastal erosions. This could be made a requirement or any farmer / fisherman interested is acquiring loans for agriculture purpose or fishing purpose.

Time and again, it has been observed effective crop insurance scheme and uptake have played major role in managing risk arise out of various vagaries related to natural calamities. Kerala has its own crop insurance scheme in addition to national schemes such as the Pradhan MantriFasalBimaYojana (PMFBY) and the Weather Based Crop Insurance Scheme (WBCIS), however the uptake observed to be less than 10% across the state, indicating high resilience from farming community.

In this context, it is required to develop a roadmap for enhancing the requisite knowledge among the beneficiaries (including farmers) related to insurance products/services and envisaged benefits thereof. The strategy under this would also detail out the necessary steps to be taken to improve the uptake of such products/services among the larger pool of beneficiaries.

3. OBJECTIVES: The objectives of the proposed study

The broad objective of the proposed assignment is to review existing environment of crop insurance products/services in the state and develop strategy and roadmap to expand awareness of crop insurance and improve uptake of these products/services.

4. SCOPE OF WORK: An indicative list of the services to be performed within the proposed study

The broad scope of work shall include:-

- An assessment of the current agriculture insurance ecosystem in state – the available products and their features, beneficiaries, status of utilization, penetration, reach, advantages and disadvantages, implementation framework, network of institutions, network of stakeholders and players, etc
- Assess the overall level of awareness on crop insurance among farmers and relevant stakeholder groups
- Assess the challenges faced by the beneficiaries and all the relevant stakeholders
- Assess the training and capacity building requirements for all the relevant government stakeholders (Department officials, extension officers, etc)
- Suggest changes/improvisations to the existing agriculture insurance products and redesign the products after rectifying the existing anomalies
- Develop action plan, strategies, and a timeline-bound implementation roadmap to expand awareness and increase uptake of agriculture insurance products

Enhance disaster response capabilities of the Agriculture department

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2. CONTEXT: The rationale for the proposed study

Kerala is highly vulnerable to natural disasters and the changing climatic dynamics given its location along the sea coast and with a steep gradient along the slopes of the Western Ghats. The Kerala State Disaster Management Plan identifies 39 hazards categorized as naturally triggered hazards (natural hazards) and anthropogenically-triggered hazards (anthropogenic hazards). Kerala is also one of the most densely populated Indian states, making it more vulnerable to damages and losses on account of disasters.

Floods are the most common natural hazard in the State. Nearly 14.5% of the State's land area is prone to floods, and the proportion is as high as 50% for certain districts. Landslides are a major hazard along the Western Ghats in Wayanad, Kozhikode, Idukki, and Kottayam districts. Seasonal drought-like conditions are also common during the summer months. Kerala experienced 66 drought years between

1881 and 2000. Dry rivers and lowering water tables in summer have led to water scarcity both in urban and rural areas. Other major natural hazards are lightning, forest fires, soil piping, coastal erosion, and high wind speed. The state also lies in seismic zone III.

In the aftermath of the floods which ravaged the State in 2018, it was observed that the disaster response abilities and competencies of the Department of Agriculture needs to be enhanced to minimize the losses, and expedite the progress towards recovery and restoration. The weak institutional capacity to deal with high-intensity disasters, inadequate early warning systems and respective protocols, limited Disaster Risk Management (DRM) and slow roll out of community-based DRM activities are challenges which need to be addressed.

In this context, it is required to review and enhance disaster response capabilities of the Department of Agriculture.

3. OBJECTIVES: The objectives of the proposed study

The broad objective of the proposed assignment is to review, assess, build and enhance the disaster response capabilities of the Department of Agriculture and its associated institutions and organizations.

4. SCOPE OF WORK: An indicative list of the services to be performed within the proposed study

The broad scope of work shall include:-

- Evaluation of the past performance of the Department of Agriculture in disaster response and management and the impact of its initiatives, with special focus on the performance related to the floods of 2018
- Institutional Review and Gap Analysis of the disaster-response mechanisms of the Department of Agriculture and its associated institutions (both statutory as well as programmatic). The review shall include (but is not limited to) assessment of the capacities, systems, processes, programs, technology and resources at the organizational level as well as the individual level for planning, strategic decision making, implementation, co-ordination, convergence, reporting, and monitoring in disaster management
- Conduct of a training needs assessment of the officials of the Department of Agriculture and its associated institutions
- Preparation of training strategies, training plan and training calendar for building and enhancing the disaster management capabilities. These should also include scope for refresher training and retraining.
- Support in identification of suitable training providers and capacity building agencies, and support in coordination with them to facilitate timely and quality training and capacity building activities
- Identification of suitable locations for site visits and study tours for the officials of the Department of Agriculture and its associated institutions to understand disaster management strategies, and appreciate the implementation of disaster response techniques

- Identification of scope of convergence with other Departments and organizations, and facilitate synergistic functioning and complementing efforts
- Benchmarking of national and international best practices and consideration of contextualized implementation
- Identification of the changes to be brought about in policies, programs, and initiatives related to the Department of Agriculture and its associated institutions for building and enhancing the disaster management capabilities
- Preparation of a roadmap and action plan for disaster management and response
- Preparation of Monitoring Framework to regularly monitor the progress and performance of pre and post disaster response and management

Assessment of influence of crops and cropping pattern being followed in hill slopes on the increasing land slide probability and Study of possible solutions based on global best practices

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The hill districts are suited for spices and plantation crops. Further, cropping in hilly regions such as Idukki and Wayanad districts is intensive, however, is unplanned and does not address risks posed by possible landslides. Also the top soil in such region is prone to erosion due to flood. The use of intercropping techniques such as combining shallow-root crops with deep-root crops is also not widespread leaving plantation crops vulnerable to damages through topsoil erosion.

In addition, Kerala has an extremely hilly terrain, nearly 90% of the terrain is hilly which acts as a challenge for the transportation sector and therefore hinders the development of crop diversification and intensification.

In this regard, it is required to conduct a study on landslide risks; development of cropping pattern in hilly regions; adoption of relevant best practices for long term development of agro ecosystem in the landslide prone regions.

3. OBJECTIVES: The objectives of the proposed study

The broad objective of the proposed assignment to conduct a study on landslide risks; development of cropping pattern in hilly regions; adoption of relevant best practices for long term development of agro ecosystem in the landslide prone regions.

4. SCOPE OF WORK: An indicative list of the services to be performed within the proposed study

The broad scope of work shall include:-

- Comprehensive assessment of current status of cultivation of crops in hillslopes across Kerala including existing cropping patterns, agricultural practices and social community practices
- Assess the impacts (short/medium/long term) of the agricultural practices on the hill ecosystem particularly, in those areas that are prone for landslides
- Review global/local best practices on crops and cropping pattern, and landslide management from across comparable geographies, that can be relevant and adopted to local conditions
- Prepare case studies (atleast 15) on cropping pattern and landslide management undertaken in countries which have been affected by disasters, with special focus on innovative activities and technologies
- Prepare an action plan for mitigation of the risks associated with landslides and preservation of hill ecosystem including creating awareness, capacity building of farmers and other stakeholders

Conduct Institutional assessment of Department of Agriculture, identify gaps and develop re-engineering/restructuring roadmap and effective operational mechanisms for alignment with agro ecological approach and effective delivery of schemes and services

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- Developing and coordinating the implementation of the RKDP;
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- Supporting Government departments & agencies in effecting agreed policy and institutional changes, project preparation and implementation and, in select cases, directly undertake activities and projects that are critical for recovery and resilience;
- Entering into and enabling partnerships with nongovernmental and civil society entities, development partners, financing partners, the private sector, academia and think tanks for the implementation of the RKDP;
- Ensuring an inclusive, participatory and consultative process of implementation of the RKDP;
- Undertaking M&E and conducting performance review of RKDP; and
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The RKI and the Department of Agriculture, Government of Kerala shall work together, in coordination with other related stakeholders and agencies, to enable the following:-

- Developing sustainable, responsible, integrated, inclusive, eco-friendly, and resilient agriculture in line with the policies of Government of Kerala and Government of India.
- Implementation of an inclusive recovery strategy promoting the participation and well-being of women and other vulnerable groups in agriculture, fisheries, livestock, and allied activities.
- Reconstruction efforts in the agriculture sector, with special attention on increasing economic activity and sector resilience to disaster events, in accordance with the principles of 'Build Back Better (BBB)'.
- Short term recovery with focus on provision of inputs and restocking, replacement or repair of assets and infrastructure, and finding alternative income sources for the population.
- Medium- and long-term activities with focus on
    - Building resilience of each subsector through environmentally sustainable integrated farming systems,
    - Community-based management of water resources,
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    - Improvements in value chain, setting up of early warning systems, and effective communication with enhanced GIS/technology backed capabilities.
    - Agriculture development in tandem with effective and timely implementation of all developmental programs of local bodies, State and Central Government using modern scientific techniques and information technology.
    - Increasing awareness of modern farming techniques and technologies to farmers to cope with the vagaries of nature which is essential for the survival of the farming community.
    - Extension activities - restructured into Agro-ecological Management Units (AEMUs) having similar soil, climate and crop patterns; and the present Agriculture Technology Management Agency (ATMA) restructured to address the extension needs of the AEMUs.

2. CONTEXT: The rationale for the proposed study

The institutional framework of the agriculture sector in Kerala faces several challenges including coordination issues between different agencies, overburdened grassroots institutions, capacity gaps at different levels, multiple lines of reporting, focus on delivery of subsidies / schemes and outdated monitoring mechanisms. Within the RKDP, one of the major interventions planned is the comprehensive assessment of the institutions and their re- engineering for more effective delivery through restructuring, redefining of roles and responsibilities, strengthening staffing, capacity building and improving alignment with AEMU-centered strategy for sector's growth.

Appropriate utilization of human resources has been affecting the sector over a period of time, especially

the KrishiBhavans. They are currently overburdened with more administrative activities due to execution of multiple agri-sector schemes, as against providing farm services to the cultivators. The staff strength of KrishiBhavans has not been augmented over the years.

In this context, it is required to conduct an institutional assessment and prepare a roadmap for institutional strengthening of the Department of Agriculture.

3. OBJECTIVES: The objectives of the proposed study

The broad objective of the proposed assignment is to undertake an institutional assessment of the Department of Agriculture in Kerala, identify gaps and develop re-engineering/restructuring roadmap and effective operational mechanisms for alignment with agro-ecological approach and effective delivery of schemes and services.

4. SCOPE OF WORK: An indicative list of the services to be performed within the proposed study

Broadly, the scope of work encompasses the following:-

- Conducting a comprehensive institutional review of the Department of Agriculture and the associated institutions (both statutory as well as programmatic) and its linkages and collaboration with other organizations, also intermediaries linked through PPP platforms. The review shall include (but is not limited to) assessment of the capacities, systems, processes, programs, and resources at the organizational level as well as the individual level for planning, strategic decision making, implementation, co-ordination, convergence, reporting, and monitoring functions. The assessment
- Identification and assessment of the gaps, challenges, constraints, issues and concerns related to effective and efficient functioning of the Department of Agriculture and the associated institutions, organizations, and agencies linked to it. This shall include (but is not limited to) assessment of the capacities, systems, processes, programs, and resources at the organizational level as well as the individual level
- Assessment of the training and capacity building needs of the officials, and preparation of training calendar and modules
- Preparation of job roles and job descriptions for officials
- Benchmarking of national and international best practices and consideration of contextualized implementation
- Identification of the changes to be brought about in policies, schemes, programs, and initiatives related to the Department of Agriculture and the associated institutions, organizations, and agencies
- Assessment of the alignment of the Department of Agriculture with the agro ecological regions in the State
- Providing recommendations on revamp of the organizational structure to support effective decision making and reporting
- Preparation of a roadmap and action plan for institutional strengthening, capacity building and organizational development

Review current institutional pathways for development of Kuttanad and Kole region, and recommend structure of Kuttanad and Kole Transformation Councils and operational mechanisms to coordinate with line departments for effective implementation

1. BACKGROUND: The Rebuild Kerala Initiative (RKI) and its sectoral priorities

The State of Kerala went through the worst-ever floods in history since 1924 between the period of June 1 and 19 August 2018. One-sixth of the State's population (about 5.4 million) were affected. The floods and the accompanying landslides were catastrophic in terms of loss of lives, livelihoods, property and infrastructure.

In its response to recover from flood devastation and to develop a green and resilient Kerala, the Government of Kerala developed an inclusive and comprehensive roadmap, which was transitioned into the Rebuild Kerala Initiative (RKI). The RKI's mandate is to develop, coordinate, facilitate and monitor the Rebuild Kerala Development Programme (RKDP) through a participatory and inclusive process.The RKDP encompasses crosscutting and sector-based policy, regulatory and institutional actions as well as priority investment programs that are critical for resilient and sustainable recovery and rebuilding of the State. It aims to catalyze the rebuilding of Kerala in a way that addresses the key drivers of floods and other natural disasters and climate change risks and strengthens preparedness against future disasters. Through the RKDP, the Government of Kerala (GoK) aims to ensure a resilient recovery and development pathway for a *Nava Keralam*.

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2. CONTEXT: The rationale for the proposed study

To meet the above requirements and address the overarching challenges across various levels, a multi-pronged approach will be adopted, with focus on an archeological approach for sustainable and resilient agriculture, restoration of damaged soil, re-engineering institutional framework for effective last mile delivery, technological interventions for enhanced monitoring, building knowledge base, creation of enabling agribusiness environment, capacity building initiatives and access to institutional finance for value chain actors.

Kuttanad and kole regions are one of the major affected areas in the state, which requires immediate

attention to rebuild and recover from devastation.

In this context, it is required to conduct a review current institutional pathways for development of Kuttanad and Kole region, and recommend structure of Kuttanad and Kole Transformation Councils and operational mechanisms to coordinate with line departments for effective implementation.

3. OBJECTIVES: The objectives of the proposed study

The broad objective of the proposed assignment is to conduct a review of the agriculture-related policy environment in the State of Kerala and develop recommendations to promote disaster-resilient crops, integrated farming systems and agro-ecological approach.

4. SCOPE OF WORK: An indicative list of the services to be performed within the proposed study

The broad scope of work shall include:-

- Review of current institutional framework of Kuttanad and Kole regions including current organizational structure and technological infrastructure of the councils
- Review the coordination mechanism of the councils with other line departments and identify the key challenges impacting overall efficiency
- Undertake benchmarking exercise other similar councils in the country and review best practices
- Develop a strategic roadmap for effective functioning of councils.
- Provide recommendations for enhancing the relevance, effectiveness and efficiency of the institutional pathways

Conduct review of policy environment and develop recommendations to promote disaster-resilient crops, integrated farming systems and agro-ecological approach

1. BACKGROUND: The Rebuild Kerala Initiative (RKI) and its sectoral priorities

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- Supporting Government departments & agencies in effecting agreed policy and institutional changes, project preparation and implementation and, in select cases, directly undertake activities and projects that are critical for recovery and resilience;
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The agriculture sector was heavily affected during the floods. The mid-lands and low-lands (Kuttanad and Kole regions) witnessed massive flooding and inundation of fields, resulting in rotting of crops and wilting of trees, causing significant losses to farmers. Idukki district, which is characterized by hilly terrain of the Western Ghats, saw large tracts of agricultural land and plantation crops wiped out due to torrential rainfall and massive flow of water. Approximately 1.08 million farmer households have been affected by

the floods. The total cultivated area affected by floods is an estimated 236,650 ha, which is about 11% of the State's area under cultivation. The most affected crops are pepper (98,000 ha), cardamom (35,750 ha), paddy (35,820 ha), banana (21,620 ha), tapioca (12,100 ha) and vegetables (10,850 ha). Total crop losses are estimated at Rs. 18,545 crore, with the maximum losses in pepper, cardamom and banana crops.

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- Developing sustainable, responsible, integrated, inclusive, eco-friendly, and resilient agriculture in line with the policies of Government of Kerala and Government of India.
- Implementation of an inclusive recovery strategy promoting the participation and well-being of women and other vulnerable groups in agriculture, fisheries, livestock, and allied activities.
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    - Extension activities - restructured into Agro-ecological Management Units (AEMUs) having similar soil, climate and crop patterns; and the present Agriculture Technology Management Agency (ATMA) restructured to address the extension needs of the AEMUs.

2. CONTEXT: The rationale for the proposed study

The Government of Kerala produced its first policy on agriculture in the year 1992. Subsequently, there have been a number of policies formulated – land related, water related, soil related, climate and environment related, policies related to watershed development approach, policies to alleviate farmer distress, policies related to human resource development in farm sector, policies on technology application in agriculture, policies on international trade, policies on insurance and agricultural credit, etc. In the aftermath of the floods, the need to revisit and revamp these policies has emerged in order to strengthen their effectiveness in catering to the requirements of recovery and rebuilding of the agriculture sector of Kerala.

The major challenges observed in the State include (i) limited capacity of grassroots institutions at Panchayat level especially the KrishiBhavans,(ii)focus on only scheme implementation rather than achieving outcomes, (iii) poor coordination and convergence among different stakeholders, (iv) limited

monitoring and oversight, (v) lack of updated technology and limited use of ICT and MIS, (vi) ineffective irrigation systems,(vii) limited infrastructure and investment therein, (viii) unplanned cropping pattern in hilly areas (where top soil is prone to erosion), (ix) low awareness of farmers on crop insurance/financial products, (x) declining productivity of various crops, and (xi) limited access to quality inputs.

3. OBJECTIVES: The objectives of the proposed study

The broad objective of the proposed assignment is to conduct a review of the agriculture-related policy environment in the State of Kerala and develop recommendations to promote disaster-resilient crops, integrated farming systems and agro-ecological approach.

4. SCOPE OF WORK: An indicative list of the services to be performed within the proposed study

The broad scope of work shall include:-

- A detailed review of the related policies and assessment of the challenges, complexities, gaps, and vulnerabilities
- Benchmarking of national and international best practices and consideration of contextualization of policy-related elements
- Listing of possible policy options, with considerations of public-private partnerships, community partnerships, and principles of inclusiveness, social equity, access, quality and relevance
- Preparation of policy frameworks, policy documents, and related implementation strategies
- Assessment of the convergence of initiatives, schemes and programs of the related Departments and agencies, and preparation of recommendations for improved integration
- Estimation of functional, institutional, technological and financial requirements
- Provide recommendations for the realignment and development of agriculture schemes, planning and budgeting along agro-ecological divisions to move from crop-based schemes to farming systems based on agriculture promotion

The above-mentioned work are expected to result in the following, among other outcomes:-

- Strengthening the policy framework and developing recommendations for development of Kerala's Agriculture sector based on Agro-ecological Management Units (AEMUs)
- Developing a policy framework and developing recommendations to consider the various upland to lowland geographical continuums in the State with focus on drainage development and moisture preservation, water table improvement etc.
- Strengthening the policy framework and developing recommendations to promote disaster resilient crop varieties in specific agro-ecological zones
- Strengthening the policy framework and developing recommendations for promoting sustainable, ecology-friendly and integrated development of agriculture and allied sectors in Kole and Kuttanad wetlands
- Strengthening the policy framework and developing recommendations to promote integrated farming systems specific in specific agro-ecological zones for risk mitigation, resilience and soil health enhancement
- Strengthening the policy framework and developing recommendations to promote disaster resilient crop varieties in specific agro-ecological zones

Study of the impact of unprecedented flood on soil health and fertility

1. BACKGROUND: The Rebuild Kerala Initiative (RKI) and its sectoral priorities

The State of Kerala went through the worst-ever floods in history since 1924 between the period of June 1 and 19 August 2018. One-sixth of the State's population (about 5.4 million) were affected. The floods and the accompanying landslides were catastrophic in terms of loss of lives, livelihoods, property and infrastructure.

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2. CONTEXT: The rationale for the proposed study

Kerala has dominantly highly weathered lateritic soils which are acidic, kaolinitic, gravelly with low cation exchange capacity, low water holding capacity and high phosphorus fixation. In the aftermath of the floods, substantial change has been observed in the physical and chemical composition of the soil of the State, with long-term consequences for soil health and fertility due to large-scale flooding, silt deposition and topsoil erosion (due to landslides). Preliminary observations indicate changes in soil acidity levels in several regions. The severe damages range from surface crusting, surface cracking, loss of soil flora and fauna such as microbes, useful fungi, earthworms, etc. in addition to the loss of nutrients due to leaching and the loss of surface soil in many areas.

Analysis of soil samples collected, by scientists of the Kerala Agricultural University (KAU), from various parts of the State shows that erosion of surface soil from high ranges and high attitude regions has

resulted in loss in fertility due to leaching of nutrients. But deposits of silt and clay in plains, river, deltas and rice paddies have enriched the soil in these stretches with nutrients except magnesium and boron. Depletion of soil organic carbon, with losses of nitrogen, phosphorus, potassium, calcium, magnesium, sulphur and boron, has been observed in areas affected by erosion. Drastic reduction in pH, resulting in increased soil acidity, was also detected.

The Department of Soil Survey and Soil Conservation has documented the extent and type of soil damages in its study report titled “Soil Health Status in Kerala in Post Flood Scenario”.

One of the major interventions planned under the RKDP is the restoration of damaged soil including time-bound action plan to restore/rectify the damages like top soil losses, hard crust formation, changes in water holding capacity, chemical changes, loss of soil microbes, flora and fauna, etc.. This will also require acensus-scale assessment of the damages and recommendations for a time-bound implementable action plan in order to restore and improve the quality of damaged soil.

3. OBJECTIVES: The objectives of the proposed study

The broad objective of the proposed assignment is to study and assess the impact of unprecedented flood on soil health and fertility, and suggest recommendations for restoration and amelioration.

4. SCOPE OF WORK: An indicative list of the services to be performed within the proposed study

The scope of work shall include:-

- Study of the status of changes in physical and chemical composition of the soil and its impact on soil structure, texture, fertility, moisture retention capacity, and other parameters
- Detailed assessment of the short-term, medium-term and long-term consequences (positive as well negative) on the soils due to the floods and their direct and indirect impact on crop performance
- Evaluate the socio-economic impact caused by the changes in soil health and fertility
- Evaluate the environmental impact caused by the changes in soil health and fertility
- Preparation of recommendations for soil recovery, restoration and amelioration
- Detailed assessment of the extent to which the State policies, programmes, interventions, schemes and institutions were successful in addressing the deterioration of soil health and fertility caused to floods; identify gaps and suggest recommendations for strengthening the preparedness to handle the damages caused due to calamities
- Examining the extent to which the government awareness programmes and campaigns have been successful in supporting the farming community to adopt appropriate measures for soil recovery and restoration
- Benchmarking of national and international best practices for soil recovery measures undertaken in the aftermath of natural calamities and consideration of their contextualization in Kerala, provision of key recommendations of the maintenance and/or improving of soil health and fertility
- Preparation of a Monitoring Framework for continuous monitoring of the key indicators/ parameters,

and Evaluation Framework for conducting related studies to progressively measure the soil health and fertility.

- Identification of the skill and/or capacity Gaps among the key stakeholders [farmers, service providers, intermediaries, and government officials] – in protecting, maintaining and improving soil health and fertility' of vulnerable hotspots.

It is expected that the agency will undertake primary research as well as secondary research, and identify key indicators and/or proxies which shall be used to gather and track quantitative as well as qualitative data. Wherever sampling procedures are to be adopted, the agency shall use scientific sampling techniques. The agency should map key data/information sources to credibly and consistently establish the 'soil health' and 'fertility'.

Develop strategic paper for agro-marketing of key Kerala crops &Undertake value chain studies of key Kerala crops (including selected disaster resilient crop varieties)

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- Reporting to the High-level Empowered Committee (HLEC), the Advisory Council, the Chief Minister and the Council of Ministers on all matters pertaining to the RKDP, including Programme progress and results on a regular basis.

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the floods. The total cultivated area affected by floods is an estimated 236,650 ha, which is about 11% of the State's area under cultivation. The most affected crops are pepper (98,000 ha), cardamom (35,750 ha), paddy (35,820 ha), banana (21,620 ha), tapioca (12,100 ha) and vegetables (10,850 ha). Total crop losses are estimated at Rs. 18,545 crore, with the maximum losses in pepper, cardamom and banana crops.

The RKI and the Department of Agriculture, Government of Kerala shall work together, in coordination with other related stakeholders and agencies, to enable the following:-

- Developing sustainable, responsible, integrated, inclusive, eco-friendly, and resilient agriculture in line with the policies of Government of Kerala and Government of India.
- Implementation of an inclusive recovery strategy promoting the participation and well-being of women and other vulnerable groups in agriculture, fisheries, livestock, and allied activities.
- Reconstruction efforts in the agriculture sector, with special attention on increasing economic activity and sector resilience to disaster events, in accordance with the principles of 'Build Back Better (BBB)'.
- Short term recovery with focus on provision of inputs and restocking, replacement or repair of assets and infrastructure, and finding alternative income sources for the population.
- Medium- and long-term activities with focus on
    - Building resilience of each subsector through environmentally sustainable integrated farming systems,
    - Community-based management of water resources,
    - Promotion of traditional indigenous livestock breeds (resilient to local conditions)
    - Improvements in value chain, setting up of early warning systems, and effective communication with enhanced GIS/technology backed capabilities.
    - Agriculture development in tandem with effective and timely implementation of all developmental programs of local bodies, State and Central Government using modern scientific techniques and information technology.
    - Increasing awareness of modern farming techniques and technologies to farmers to cope with the vagaries of nature which is essential for the survival of the farming community.
    - Extension activities - restructured into Agro-ecological Management Units (AEMUs) having similar soil, climate and crop patterns; and the present Agriculture Technology Management Agency (ATMA) restructured to address the extension needs of the AEMUs.

2. CONTEXT: The rationale for the proposed study

To meet the above requirements and address the overarching challenges across various levels, a multi-pronged approach will be adopted, with focus on an archeological approach for sustainable and resilient agriculture, restoration of damaged soil, re-engineering institutional framework for effective last mile delivery, technological interventions for enhanced monitoring, building knowledge base, creation of enabling agribusiness environment, capacity building initiatives and access to institutional finance for value chain actors.

One of major investment planning exercises proposed is to strengthen value chain & implementing agro-marketing initiatives of key Kerala crops (including disaster resilient varieties) and increase private sector investment in sector. In this regard, it is important to conduct a detailed value chain study around key

crops to understand the key challenges faced in various facets of Agri value chain and address the impact of flood on agro-commodities, so as to strategize and implement the roadmap for overall agriculture development, improve agribusiness environment in the state and cater future disaster management requirement in both short term and long term frame of time.

3. OBJECTIVES: The objectives of the proposed study

The broad objective of the proposed assignment is to conduct study on prevailing value chain of key commodities in the state and provide recommendations on the avenues of strengthening of value chain.

4. SCOPE OF WORK: An indicative list of the services to be performed within the proposed study

The broad scope of work shall include:-

- Analysis of value chains of (i) Coconut, (ii) Spices, (iii) Vegetables, (iv) Fruits – pineapple, mango and banana, (v) Flowers
- Analysis of key value chain actors and stakeholders
- Assessment of enabling ecosystem (including policies) to support marketing/forward linkage of key value chains
- Status of involvement of Farmer Producer organizations (a sample of atleast 100FPOs), self-help groups etc. involved along the value chain and potential areas of their further development.
- Map major production areas and major market centers; and Identify go-to-market strategies
- Study gaps in the current status of disaster-resilient crop varieties/hybrids available for the above select crops
- Analysis of potential for enhancing food processing; opportunities for increasing government, public sector and private sector investments along the above value chains in building infrastructure
- Study the present level of financial inclusion in the value chain of above mentioned crops
- Identify gaps in promoting entrepreneurship in the identified value chains
- Prepare individual strategic roadmaps for developing efficient, sustainable and competitive value chains for the select crops

Data Bank Creation - Comprehensive Survey to study the Milk Procurement Pattern through Dairy Cooperatives and other means

1. BACKGROUND: The Rebuild Kerala Initiative (RKI) and its sectoral priorities

The State of Kerala went through the worst-ever floods in history since 1924 between the period of June 1 and 19 August 2018. One-sixth of the State's population (about 5.4 million) were affected. The floods and the accompanying landslides were catastrophic in terms of loss of lives, livelihoods, property and infrastructure.

In its response to recover from flood devastation and to develop a green and resilient Kerala, the Government of Kerala developed an inclusive and comprehensive roadmap, which was transitioned into the Rebuild Kerala Initiative (RKI). The RKI's mandate is to develop, coordinate, facilitate and monitor the Rebuild Kerala Development Programme (RKDP) through a participatory and inclusive process.The RKDP encompasses crosscutting and sector-based policy, regulatory and institutional actions as well as priority investment programs that are critical for resilient and sustainable recovery and rebuilding of the State. It aims to catalyze the rebuilding of Kerala in a way that addresses the key drivers of floods and other natural disasters and climate change risks and strengthens preparedness against future disasters. Through the RKDP, the Government of Kerala (GoK) aims to ensure a resilient recovery and development pathway for a *Nava Keralam*.

The key responsibilities of the RKI include:

- Developing and coordinating the implementation of the RKDP;
- Facilitating transformative policy, institutional realignments and critical programme investments that address the fundamental drivers of floods and other natural disaster so that to better prepare Kerala for future disasters and climate change risks;
- Mobilizing public, private and community-based resources for the implementation of the RKDP;
- Supporting Government departments & agencies in effecting agreed policy and institutional changes, project preparation and implementation and, in select cases, directly undertake activities and projects that are critical for recovery and resilience;
- Entering into and enabling partnerships with nongovernmental and civil society entities, development partners, financing partners, the private sector, academia and think tanks for the implementation of the RKDP;
- Ensuring an inclusive, participatory and consultative process of implementation of the RKDP;
- Undertaking M&E and conducting performance review of RKDP; and
- Reporting to the High-level Empowered Committee (HLEC), the Advisory Council, the Chief Minister and the Council of Ministers on all matters pertaining to the RKDP, including Programme progress and results on a regular basis.

The animal husbandry and dairy sector was heavily affected during the floods. During the 2018 floods the State suffered massive damages including loss of cattle, buffalo, goat, pig, chicken, duck etc. life and loss to fodder plots, cattle sheds, farms and much more. The loss in this sector accounted for nearly Rs. 172 crore. This includes losses incurred due to death of livestock, destruction of animal sheds, damage to feed, fodder and hay, and infrastructure loss. An estimated 5163 adult cattle, 5193 calves, 541 buffalo,

1228 heifers, 6380 goats, 1053 pigs, 11.43 lakh chicken and 4.64 lakh ducks, 20000 quails, and 50 rabbits were reported dead or missing. Loss due to animals is estimated at Rs. 84 crore. The loss due to damage of animal sheds, feed, fodder plots, infrastructure and other resources of farmers accounts to about Rs. 60 crore. Infrastructure loss to 214 Dairy Co-operative Societies, milk production loss due to flooding and damage incurred to Veterinary Institutions together amounts to about 27 crores. Milk value loss is estimated at around Rs. 3.84 crore.

The Dairy Development Department was at the forefront of the flood relief operations. A few of the Department's recovery efforts are summarized below:

- With the intervention of the District Collectors and the Regional Cooperative Milk Producers Unions, the Dairy Development Department could restore the milk collection of the flood affected areas with minimal interruption.
- Nearly 40813.5 litres of milk were distributed to relief camps across the State. The expense of Rs. 14.28 lakh was borne by the Dairy Cooperatives.
- In association with Dairy Co-operatives, 31 relief camps and 582 houses were visited, and food and essential commodities worth Rs. 2.42 lakh were distributed
- Through the Donate a Cow Programme, around 300 milch animals were distributed to dairy farmers who lost animals due to floods.
- Rs. 22 crore worth of special rehabilitation Programmes were implemented for flood-affected dairy farmers of the State during the year 2018-19. Around 3000 milch animals were distributed and 2130 farmers were assisted in shed renovation / shed construction and others in a need-based manner.

The Government of Kerala is taking several steps to revive and revitalize the dairy sector. A major step is the establishment of 4 distinct dairy zones on the basis of factors like climate, geography, number of families involved in dairying, availability of milch animals, productivity of animals, fodder availability, availability of free space for fodder cultivation, availability of pasture lands, locally available feed stuff, availability of dairy cooperatives, marketing options, veterinary health facilities, etc. The proposed 4 dairy zones are (i) Highly Potential Dairy Zone, (ii) Prospective Dairy Zone, (iii) Mediocre Dairy Zone, and (iv) Challenging Dairy Zone. The mode of dairy development in each zone shall be unique in respect to factors like the type of milch animals, shed constructions, type of fodder to be propagated, marketing options, etc. The strategy adopted shall encourage tapping available and locally available natural resources.

Participatory implementation of activities will be ensured. The beneficiary selection of schemes and projects for the sector will continue to be made through Grama Sabha which ensures peoples participation. Most of the schemes implemented in this sector will continue to be routed through Dairy cooperatives and established groups.

Efforts will be made to establish e-governance in the Department of Dairy Development and develop unified software for dairy cooperatives to ensure efficient resource mapping and planning, transparency and accountability of all operations. 3673 registered dairy co-operatives will be provided with unified accounting and administration software with integration provisions for all stakeholders like Dairy Department, regional unions etc. The dairy co-operatives are also expected to be actively involved in the other interventions like herd induction programs, heifer parks, fodder development programs, implementation of Total Quality Management, pollution control and energy conservation systems in dairy sector.

2. CONTEXT: The rationale for the proposed study

It is estimated that, in Kerala, 8 lakh families are involved in dairying activities. However only 20% of these come under the co-operatives umbrella. There are 3673 dairy co-operatives in Kerala, as on 31st May 2018.

Region	District	Number of co-operatives		
		APCOS	Traditional	Total
Trivandrum	Trivandrum	344	78	422
	Kollam	283	62	345
	Pathanamthitta	187	16	203
	Alappuzha	248	21	269
Ernakulam	Kottayam	255	27	282
	Idukki	195	15	210
	Ernakulam	326	14	340
	Thrissur	232	59	291
Malabar	Palakkad	329	21	350
	Malappuram	260	28	288
	Kozhikode	236	15	251
	Wayanad	54	2	56
	Kannur	169	54	223
	Kasargod	136	7	143
		3254	419	3673

In order to scientifically plan the dairy development projects, the actual quantum/share of milk handled by the dairy co-operatives in comparison to the total milk production of the State has to be ascertained.

3. OBJECTIVES: The objectives of the proposed study

The objective of the study is to undertake a comprehensive survey to study the milk procurement pattern through dairy cooperatives and other means

4. SCOPE OF WORK: An indicative list of the services to be performed within the proposed study

Broadly, the scope of work encompasses the following:-

- Map the milk procurement processes and activities through dairy cooperatives and all other means which are prevalent in Kerala, and also map the related stakeholders
- Establish a list of indicators which can be used to collect the required data, and can be subsequently

tracked to ascertain the trends, status and/or progress. This shall include (but is not limited to) the total number of dairy farmers in the State, the ratio between substantive farmers and entrepreneurs in dairy sector, the share of milk procured by the dairy cooperatives sector in Kerala, etc

- Ascertain the following, and compare it with regional and national status/trends:-
  - The total number of dairy farmers in Kerala
  - The ratio between substantive farmers and entrepreneurs in dairy sector in Kerala
  - The share of milk procured by the dairy cooperatives sector in Kerala
  - The prospective dairy farmers of Kerala
  - The share of milk rurally sold in Kerala
  - The attributes, characteristics, and specific challenges of the urban dairy market vis-a-vis rural dairy market
  - The scope for value addition of milk in Kerala market
  - Any other relevant indicator/parameter pertaining to the dairy development sector
- Develop a strategic roadmap to create a data-driven and efficient milk value chain including creation of a databank that will help in better policy making and effective implementation on groundReviewvarious existing infrastructure (e.g. power, telecommunication, information technology) and in the selected areas in view of creating a databank for improving efficiency in the milk value chain
- Comprehensive end to end analysis of the existing milk value chain in the State to understand the challenges at every level with specific reference to data flow
- Comprehensive review of existing manpower (e.g. use of technology by the staff, knowledge levels) and future requirements; identify gaps in knowledge & skills in using technologies and design appropriate training and capability building programs for effective management of the databank
- Review the best practices and systems available in the comparable geographies and document best practices that can be adopted to local conditions
- Design an appropriate support system for enhancing timeliness and accuracy of decisions to be taken to improve efficiency of milk value chain

Conduct Institutional assessment of Animal Husbandry and Dairy Development, identify gaps and develop a restructuring road map and effective operational mechanism for effective delivery of schemes and services

1. BACKGROUND: The Rebuild Kerala Initiative (RKI) and its sectoral priorities

The State of Kerala went through the worst-ever floods in history since 1924 between the period of June 1 and 19 August 2018. One-sixth of the State's population (about 5.4 million) were affected. The floods and the accompanying landslides were catastrophic in terms of loss of lives, livelihoods, property and infrastructure.

In its response to recover from flood devastation and to develop a green and resilient Kerala, the Government of Kerala developed an inclusive and comprehensive roadmap, which was transitioned into the Rebuild Kerala Initiative (RKI). The RKI's mandate is to develop, coordinate, facilitate and monitor the Rebuild Kerala Development Programme (RKDP) through a participatory and inclusive process.The RKDP encompasses crosscutting and sector-based policy, regulatory and institutional actions as well as priority investment programs that are critical for resilient and sustainable recovery and rebuilding of the State. It aims to catalyze the rebuilding of Kerala in a way that addresses the key drivers of floods and other natural disasters and climate change risks and strengthens preparedness against future disasters. Through the RKDP, the Government of Kerala (GoK) aims to ensure a resilient recovery and development pathway for a *Nava Keralam*.

The key responsibilities of the RKI include:

- Developing and coordinating the implementation of the RKDP;
- Facilitating transformative policy, institutional realignments and critical programme investments that address the fundamental drivers of floods and other natural disaster so that to better prepare Kerala for future disasters and climate change risks;
- Mobilizing public, private and community-based resources for the implementation of the RKDP;
- Supporting Government departments & agencies in effecting agreed policy and institutional changes, project preparation and implementation and, in select cases, directly undertake activities and projects that are critical for recovery and resilience;
- Entering into and enabling partnerships with nongovernmental and civil society entities, development partners, financing partners, the private sector, academia and think tanks for the implementation of the RKDP;
- Ensuring an inclusive, participatory and consultative process of implementation of the RKDP;
- Undertaking M&E and conducting performance review of RKDP; and
- Reporting to the High-level Empowered Committee (HLEC), the Advisory Council, the Chief Minister and the Council of Ministers on all matters pertaining to the RKDP, including Programme progress and results on a regular basis.

The animal husbandry and dairy sector was heavily affected during the floods. During the 2018 floods the State suffered massive damages including loss of cattle, buffalo, goat, pig, chicken, duck etc. life and loss to fodder plots, cattle sheds, farms and much more. The loss in this sector accounted for nearly Rs. 172

crores. This includes loss incurred due to death of livestock, destruction of animal sheds, damage to feed, fodder and hay, and infrastructure loss. An estimated 5163 adult cattle, 5193 calves, 541 buffalo, 1228 heifers, 6380 goats, 1053 pigs, 11.43 lakh chicken and 4.64 lakh ducks, 20000 quails, and 50 rabbits were reported dead or missing. Loss due to animals is estimated at Rs. 84 crore. The loss due to damage of animal sheds, feed, fodder plots, infrastructure and other resources of farmers accounts to about Rs. 60 crore. Infrastructure loss to 214 Dairy Co-operative Societies, milk production loss due to flooding and damage incurred to Veterinary Institutions together amounts to about 27 crores. Milk value loss is estimated at around Rs. 3.84 crore.The mid-lands and low-lands (Kuttanad and Kole regions) witnessed massive flooding and inundation of fields, resulting in rotting of crops and wilting of trees, causing significant losses to farmers. Approximately 1.08 million farmer households have been affected by the floods.

Kerala is the only state in the country having a structured, operational, self-sustainable breeding policy for cross breeding of animals and the policy undergoes review every 4 years with inputs and involvement from all stakeholders concerned including like Kerala Veterinary and Animal Sciences University (KVASU), DairyDevelopment Department, Kerala Livestock Development Board (KLDB), Kerala CooperativeMilk Marketing Federation (KCMMF) and Livestock Farmers. At 9.02 liters, the average production is higher than the national average. But even after four decades, there are still several areas that need significant improvement.

2. CONTEXT: The rationale for the proposed study

Under implementation strategy and structure for reviving Animal Husbandry and Dairy sector, the focused approach include on re-engineering institutional framework for effective last mile delivery, reorganization of Animal Husbandry Department and the Dairy Department, development of veterinary services, improvements in livestock and poultry development including scientific rearing of calves, crossbreeding etc., strengthening research and development, establishing distinct dairy zones, Herd Induction Programmes and Heifer Parks, introducing calamity-resistant dairying/livestock/poultry farming technologies, extensive fodder development programme, promotion of premium, organic milk and A2 Milk for better price and export, pollution control and energy conservation systems in dairy sector, enactment of laws for ensuring the safety and quality of cattle/poultry feed, automation and mechanization of farm level activities and dairy co-operatives and value addition of milk, meat and poultry products.

In this context, the services of a professional, competent and credible agency are requiredto undertake an institutional assessment of the Department of Animal Husbandry in Kerala, identify gaps and develop re-engineering/restructuring roadmap and effective operational mechanisms for alignment and effective delivery of schemes and services. The strategy under this would also call out the necessary steps to be taken to improve the uptake of such products/services among the larger pool of beneficiary.

3. OBJECTIVES: The objectives of the proposed study

The broad objective of the proposed assignment is to undertake an institutional assessment of the

Department of Animal Husbandry and Department of Dairy Development in Kerala, identify gaps and develop re-engineering/restructuring roadmap and effective operational mechanisms for alignment and effective delivery of schemes and services.

4. SCOPE OF WORK: An indicative list of the services to be performed within the proposed study

Broadly, the scope of work encompasses the following:-

- Conducting a comprehensive institutional review of the Department of Animal Husbandry and Department of Dairy Development and the associated institutions (both statutory as well as programmatic) and its linkages and collaboration with other organizations, also intermediaries linked through PPP platforms.
- Identification and assessment of the gaps, challenges, constraints, issues and concerns related to effective and efficient functioning of the Department of Animal Husbandry and Department of Dairy Development and the associated institutions, organizations, and agencies linked to it. This shall include (but is not limited to) assessment of the capacities, systems, processes, programs, and resources at the organizational level as well as the individual level
- Assessment of both administrative as well as financial delegation of power of officers, and provide suggestions on realignment
- Examining the scope for merging and/on integration of departments and agencies within the animal husbandry and dairy sectors
- Assessment of the training and capacity building needs of the officials, and preparation of training modules
- Preparation of job roles and job descriptions for officials
- Benchmarking of national and international best practices and consideration of contextualized implementation
- Documentation of success models
- Identification of the changes to be brought about in policies, schemes, programs, and initiatives related to the Department of Animal Husbandryand Department of Dairy Development, and the associated institutions, organizations, and agencies
- Providing recommendations on revamp of the organizational structure to support effective decision making and reporting
- Preparation of a roadmap and action plan for institutional strengthening, capacity building and organizational development

Undertake Value Chain Studies on key animal husbandry activities

1. BACKGROUND: The Rebuild Kerala Initiative (RKI) and its sectoral priorities

The State of Kerala went through the worst-ever floods in history since 1924 between the period of June 1 and 19 August 2018. One-sixth of the State's population (about 5.4 million) were affected. The floods and the accompanying landslides were catastrophic in terms of loss of lives, livelihoods, property and infrastructure.

In its response to recover from flood devastation and to develop a green and resilient Kerala, the Government of Kerala developed an inclusive and comprehensive roadmap, which was transitioned into the Rebuild Kerala Initiative (RKI). The RKI's mandate is to develop, coordinate, facilitate and monitor the Rebuild Kerala Development Programme (RKDP) through a participatory and inclusive process.The RKDP encompasses crosscutting and sector-based policy, regulatory and institutional actions as well as priority investment programs that are critical for resilient and sustainable recovery and rebuilding of the State. It aims to catalyze the rebuilding of Kerala in a way that addresses the key drivers of floods and other natural disasters and climate change risks and strengthens preparedness against future disasters. Through the RKDP, the Government of Kerala (GoK) aims to ensure a resilient recovery and development pathway for a *Nava Keralam*.

The key responsibilities of the RKI include:

- Developing and coordinating the implementation of the RKDP;
- Facilitating transformative policy, institutional realignments and critical programme investments that address the fundamental drivers of floods and other natural disaster so that to better prepare Kerala for future disasters and climate change risks;
- Mobilizing public, private and community-based resources for the implementation of the RKDP;
- Supporting Government departments & agencies in effecting agreed policy and institutional changes, project preparation and implementation and, in select cases, directly undertake activities and projects that are critical for recovery and resilience;
- Entering into and enabling partnerships with nongovernmental and civil society entities, development partners, financing partners, the private sector, academia and think tanks for the implementation of the RKDP;
- Ensuring an inclusive, participatory and consultative process of implementation of the RKDP;
- Undertaking M&E and conducting performance review of RKDP; and
- Reporting to the High-level Empowered Committee (HLEC), the Advisory Council, the Chief Minister and the Council of Ministers on all matters pertaining to the RKDP, including Programme progress and results on a regular basis.

The animal husbandry and dairy sector was heavily affected during the floods. The mid-lands and low-lands (Kuttanad and Kole regions) witnessed massive flooding and inundation of fields, resulting in rotting of crops and wilting of trees, causing significant losses to farmers. Approximately 1.08 million farmer households have been affected by the floods.

Kerala has a thriving animal husbandry sector with about 17.5 lakh bovines (Source: 2007 census) and the policies of the Government is keen to ensure it remains a key component of supporting the livelihoods

of millions of farmers. In dairy, the present population of livestock, the state could achieve 27.13 lakh tonnes of milk / year, 3.4 lakh tonnes of meat and 170 crore eggs during 2011-12. The requirement of the same during 2011-12 was 33.72 lakh tonnes, 4.95 lakh tonnes and 594crores of milk, meat and egg respectively.

Kerala is the only state in the country having a structured, operational, self-sustainable breeding policy for cross breeding of animals and the policy undergoes review every 4 years with inputs and involvement from all stakeholders concerned including like Kerala Veterinary and Animal Sciences University (KVASU), DairyDevelopment Department, Kerala Livestock Development Board (KLDB), Kerala CooperativeMilk Marketing Federation (KCMMF) and Livestock Farmers. At 9.02 liters, the average production is higher than the national average. But even after four decades, there are still several areas that need significant improvement.

2. CONTEXT: The rationale for the proposed study

Under implementation strategy and structure for reviving Animal Husbandry and dairy sector, the focused approach include on re-engineering institutional framework for effective last mile delivery, reorganization of Animal Husbandry Department, reorganization of the Dairy Department, development of Veterinary service, Improvements in livestock and poultry development including scientific rearing of calves, crossbreeding etc., strengthening research and development, establishing distinct dairy zones, Herd Induction Programmes and Heifer Parks, introducing calamity-resistant dairying/livestock/poultry farming technologies, extensive fodder development programme, promotion of premium, organic milk and A2 Milk for better price and export, Pollution control and energy conservation systems in dairy sector, nnactment of Law for ensuring the safety and quality of cattle/poultry feed, automation and mechanization of farm level activities and dairy co-operatives and Value addition of milk, meat and poultry products.

3. OBJECTIVES: The objectives of the proposed study

The broad objective of the proposed assignment is to undertake a thorough review of the various value chains under the animal husbandry and dairy sectorto support the Department of Animal Husbandry and the Department of Dairy Development in Kerala in identifying areas that are of critical importance and take appropriate actions including effective policies and regulations.

4. SCOPE OF WORK: An indicative list of the services to be performed within the proposed study

Broadly, the scope of work encompasses the following:-

- Comprehensive review of value chains within the animal husbandry sector including milk, meat, eggs and by-products; identify areas of improvement
- Study and compare the value chains in milk across 2 routes – (i) Within co-operatives, and (ii) Within unorganized sector
- Benchmarking of national and international best practices adopted in similar contexts
- Assessment of status of involvement of Cooperatives, Farmer Producer organizations/ Self-Help Groups, private firms, and other players involved along these value chains and potential areas of their further development
- Assessment of the potential of piggery in the districts of Wayanad and Idukki
- Study of the marketing strategies adopted by farmers for selling livestock produce as premium products outside co-operative networks, and the associated product economics
- Ascertain the status of internal broiler poultry meat productions through contract farming and its economic impact
- Study gaps in the current status of disaster-resilience measures available for the above select value chains
- Analysis of potential for enhancing food processing including an assessment of enabling ecosystem (including policies) to support backward & forward linkages in select value chains within animal husbandry sector
- Evaluate potential opportunities for increasing government, public sector and private sector investments along the above value chains in building infrastructure
- Study the presentstatus ofselect socio-economic indicators (e.g. financial inclusion, technology adoption etc) in the select value chains
- Explore potential opportunitiesfor promoting entrepreneurship in the identified value chains

Comprehensive study to assess the women participation in Dairy Co-operatives and Dairying Sector

1. BACKGROUND: The Rebuild Kerala Initiative (RKI) and its sectoral priorities

The State of Kerala went through the worst-everfloods in history since 1924 between the period of June 1 and 19 August 2018. One-sixth of the State's population (about 5.4 million) were affected. The floods and the accompanying landslides were catastrophic in terms of loss of lives, livelihoods, property and infrastructure.

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- Mobilizing public, private and community-based resources for the implementation of the RKDP;
- Supporting Government departments & agencies in effecting agreed policy and institutional changes, project preparation and implementation and, in select cases, directly undertake activities and projects that are critical for recovery and resilience;
- Entering into and enabling partnerships with nongovernmental and civil society entities, development partners, financing partners, the private sector, academia and think tanks for the implementation of the RKDP;
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The Government of Kerala is taking several steps to revive and revitalize the dairy sector. A major step is the establishment of 4 distinct dairy zones on the basis of factors like climate, geography, number of families involved in dairying, availability of milch animals, productivity of animals, fodder availability, availability of free space for fodder cultivation, availability of pasture lands, locally available feed stuff, availability of dairy cooperatives, marketing options, veterinary health facilities, etc. The proposed 4 dairy zones are (i) Highly Potential Dairy Zone, (ii) Prospective Dairy Zone, (iii) Mediocre Dairy Zone, and (iv) Challenging Dairy Zone. The mode of dairy development in each zone shall be unique in respect to factors like the type of milch animals, shed constructions, type of fodder to be propagated, marketing options, etc. The strategy adopted shall encourage tapping available and locally available natural resources.

Participatory implementation of activities will be ensured. Most of the schemes implemented in this sector will continue to be routed through Dairy cooperatives and established groups.

Efforts will be made to establishe-governance in the Department of Dairy Development and develop unified software for dairy cooperatives to ensure efficient resource mapping and planning, transparency and accountability of all operations. 3673 registered dairy co-operatives will be provided with unified accounting and administration software with integration provisions for all stakeholders like Dairy Department, regional unions etc. The dairy co-operatives are also expected to be actively involved in the other interventions like herd induction programs, heifer parks, fodder development programs, implementation of Total Quality Management, pollution control and energy conservation systems in dairy sector.

2. CONTEXT: The rationale for the proposed study

It is estimated that, in Kerala, 8 lakh families are involved in dairying activities. However only 20% of these come under the co-operatives umbrella. There are 3673 dairy co-operatives in Kerala, as on 31st May 2018.

Region	District	Number of co-operatives		
		APCOS	Traditional	Total
Trivandrum	Trivandrum	344	78	422
	Kollam	283	62	345
	Pathanamthitta	187	16	203
	Alappuzha	248	21	269
Ernakulam	Kottayam	255	27	282
	Idukki	195	15	210
	Ernakulam	326	14	340
	Thrissur	232	59	291
Malabar	Palakkad	329	21	350
	Malappuram	260	28	288
	Kozhikode	236	15	251
	Wayanad	54	2	56
	Kannur	169	54	223
	Kasargod	136	7	143
		3254	419	3673

To successfully implement the strategies and activities planned under RKI, it is important to enhance the participation of members, especially women, in dairy co-operatives.

Women have always been encouraged to become active members of the dairy co-operatives.However, the participation of women has been constrained due to many factors, a major one being the structure of gender relations in the State36% of the members of the dairy co-operatives are women.

3. OBJECTIVES: The objectives of the proposed study

The objective of the study isto undertake a comprehensive study to assess the participation in Dairy Co-operatives and Dairying Sector and ways to address the challenges.

4. SCOPE OF WORK: An indicative list of the services to be performed within the proposed study

Broadly, the scope of work encompasses the following:-

- Study the profile and background of the women in dairy co-operatives and dairying sector, and assess their socio-economic status through the assessment of relevant parameters (including but not limited to APL/BPL, rural/urban, , education levels, income levels, etc)
- Conduct a review of key state policies/programs addressing women, social and economic issues in the dairy co-operatives and dairying sector
- Map the dairy-related activities undertaken by women, and assess the role, participation and influence of women in decision making,planning, administration, financing, sale of products, value addition etc.

in dairy co-operatives and dairysector.

- Identification and assessment of the gaps, challenges, constraints, issues and concerns faced by women in co-operatives, and dairysector, dairy industry and at every point in the dairy value chain, related to knowledge, technology, extension services, access to finance, conducive workplace environment and policies, etc.
- Assessment of the extent to which the occurrence of floods in 2018 affected the livelihoods of the women in the dairy co-operatives and dairying sector, and impacted their participation in the dairy co-operatives and key decision making
- Assessment of the training and capacity building needs of the women at various levels of value chain including financial literacy
- Provide recommendations on ways and means to improve the meaningful participation of women in dairy co-operatives, and dairying sector, and also enhance their benefits and profits
- Benchmarking of national and international best practices and consideration of contextualized implementation and provide recommendations to mitigate the identified challenges.
- Document the success stories and prepare case studies

Both primary and secondaryresearch methods should be used for data collection. The sample of respondents should be estimated using scientific methods of sampling. The primary data collection should be undertaken using software or customized app solution, and the link to such software should be shared with RKI and the concerned line Department to enable real-time monitoring of the progress of the study.

Review current institutional pathway for the development of Kuttanad and Kole region and recommend the structure of Kuttanad and Kole transformation councils and operational mechanism to coordinate with line departments for effective implementation

1. BACKGROUND: The Rebuild Kerala Initiative (RKI) and its sectoral priorities

The State of Kerala went through the worst-ever floods in history since 1924 between the period of June 1 and 19 August 2018. One-sixth of the State's population (about 5.4 million) were affected. The floods and the accompanying landslides were catastrophic in terms of loss of lives, livelihoods, property and infrastructure.

In its response to recover from flood devastation and to develop a green and resilient Kerala, the Government of Kerala developed an inclusive and comprehensive roadmap, which was transitioned into the Rebuild Kerala Initiative (RKI). The RKI's mandate is to develop, coordinate, facilitate and monitor the Rebuild Kerala Development Programme (RKDP) through a participatory and inclusive process. The RKDP encompasses crosscutting and sector-based policy, regulatory and institutional actions as well as priority investment programs that are critical for resilient and sustainable recovery and rebuilding of the State. It aims to catalyze the rebuilding of Kerala in a way that addresses the key drivers of floods and other natural disasters and climate change risks and strengthens preparedness against future disasters. Through the RKDP, the Government of Kerala (GoK) aims to ensure a resilient recovery and development pathway for a *Nava Keralam*.

The key responsibilities of the RKI include:

- Developing and coordinating the implementation of the RKDP;
- Facilitating transformative policy, institutional realignments and critical programme investments that address the fundamental drivers of floods and other natural disaster so that to better prepare Kerala for future disasters and climate change risks;
- Mobilizing public, private and community-based resources for the implementation of the RKDP;
- Supporting Government departments & agencies in effecting agreed policy and institutional changes, project preparation and implementation and, in select cases, directly undertake activities and projects that are critical for recovery and resilience;
- Entering into and enabling partnerships with nongovernmental and civil society entities, development partners, financing partners, the private sector, academia and think tanks for the implementation of the RKDP;
- Ensuring an inclusive, participatory and consultative process of implementation of the RKDP;
- Undertaking M&E and conducting performance review of RKDP; and
- Reporting to the High-level Empowered Committee (HLEC), the Advisory Council, the Chief Minister and the Council of Ministers on all matters pertaining to the RKDP, including Programme progress and results on a regular basis.

The animal husbandry and dairy sector was heavily affected during the floods. The mid-lands and low-lands (Kuttanad and Kole regions) witnessed massive flooding and inundation of fields, resulting in

rotting of crops and wilting of trees, causing significant losses to farmers. Approximately 1.08 million farmer households have been affected by the floods.

Kerala has a thriving animal husbandry sector with about 17.5 lakh bovines (Source: 2007 census) and the policies of the Government is keen to ensure it remains a key component of supporting the livelihoods of millions of farmers. In dairy, the present population of livestock, the state could achieve 27.13 lakh tonnes of milk / year, 3.4 lakh tonnes of meat and 170 crore eggs during 2011-12. The requirement of the same during 2011-12 was 33.72 lakh tonnes, 4.95 lakh tonnes and 594 crores of milk, meat and egg respectively.

Kerala is the only state in the country having a structured, operational, self-sustainable breeding policy for cross breeding of animals and the policy undergoes review every 4 years with inputs and involvement from all stakeholders concerned including like Kerala Veterinary and Animal Sciences University (KVASU), Dairy Development Department, Kerala Livestock Development Board (KLDB), Kerala Cooperative Milk Marketing Federation (KCMMF) and Livestock Farmers. At 9.02 liters, the average production is higher than the national average. But even after four decades, there are still several areas that need significant improvement.

2. CONTEXT: The rationale for the proposed study

Under implementation strategy and structure for reviving Animal Husbandry sector, the focused approach include on re-engineering institutional framework for effective last mile delivery, reorganization of Animal Husbandry Department, reorganization of the Dairy Department, development of Veterinary service, Improvements in livestock and poultry development including scientific rearing of calves, crossbreeding etc., strengthening research and development, establishing distinct dairy zones, Herd Induction Programmes and Heifer Parks, introducing calamity-resistant dairying/livestock/poultry farming technologies, extensive fodder development programme, promotion of premium, organic milk and A2 Milk for better price and export, pollution control and energy conservation systems in dairy sector, enactment of laws for ensuring the safety and quality of cattle/poultry feed, automation and mechanization of farm level activities and dairy co-operatives and Value addition of milk, meat and poultry products.

Kuttanad and Kole regions are one of the major affected areas in the state, which requires immediate attention to rebuild and recover from devastation.

3. OBJECTIVES: The objectives of the proposed study

The objective of the study is to conduct a review of current institutional pathways for development of Kuttanad and Kole region, and recommend structure of Kuttanad and Kole Transformation Councils and operational mechanisms to coordinate with line departments for effective implementation.

4. SCOPE OF WORK: An indicative list of the services to be performed within the proposed

study
The broad scope of work of the assignment will comprise of the following: • Review of current institutional framework of Kuttanad and Kole regions including current organizational structure and technological infrastructure of the councils • Review the coordination mechanism of the councils with other line departments and identify the key challenges impacting overall efficiency • Undertake benchmarking exercise other similar councils in the country and review best practices • Ascertain the current status of duck rearing, conservation of Charra and Chembally breeds of ducks, and the economic impact of duck rearing in the Kuttanad and Kole regions • Develop a strategic roadmap for effective functioning of councils.