

Strengthening local self-governments to integrate biodiversity conservation to the local development plans

**National Biodiversity Authority
Through: Kerala State Biodiversity Board**

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**Strengthening local self governments to integrate biodiversity
conservation to the local development plans**
Through participatory community action

**Project Report
Submitted to
National Biodiversity Authority**

**Through
Kerala State Biodiversity Board**

**By
Community Agrobiodiversity Centre
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Project description

Project proposal Title:	“Strengthening local self governments to integrate biodiversity conservation to the local development plans Through participatory community action”
The proposal submitting organization	Community Agro-biodiversity Centre, M. S. Swaminathan Research Foundation, Puthoorvayal, Meeppadi, Wayanad.
Implementing organization	Community Agro-biodiversity Centre, M. S. Swaminathan Research Foundation, Puthoorvayal, Meeppadi, Wayanad.
Name of other partner institutes	Local self Governments in Wayanad
Geographical area of project implementation	3 selected Panchayaths Namely Pozhuthan, Kottathra and Vengappally
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The project summary

Wayanad district of Kerala is a biodiversity rich, ecologically fragile geographical area strategically located in the Western Ghats. The life and livelihood of more than 80% of Wayanad's population is directly depending on the bio-resources around. But the intensive agriculture and unscientific development of the last 50 years exploited the biological resources of Wayanad to a great extent. The decentralized development policy of Kerala is giving ample political space for sustainable development based on primary production systems. But last 20 years of decentralized governance failed to integrate sustainability in to local development agenda. This in turn resulted in increased biodiversity depletion and inequality in resource access and sharing leading to environmental issues and livelihood crisis.

This project aimed to integrate biodiversity governance to the local level planning process as a development agenda of Wayanad. Indian biological diversity Act 2002 creates policy space and decentralized institutional frame work for people centered biodiversity governance. This project framed to strengthen the institutional frameworks to ensure effective implementation of BD act 2002 through

participatory action. The project focused on the interactions with Biodiversity Management committees at Panchayath level. Integration of scientific natural resource management is essential for local level development planning is vital for sustainable development.

The first phase of the project concentrated on sensitizing the Panchayath board members and BMC members of Wayanad district on BD Act 2002, other acts on biodiversity governance and the institutional frame works to implement it. The sensitization process was designed in a participatory mode to probe the community need of biodiversity governance and to come-up up with one specific project from each Panchayath. Many Panchayaths developed and implemented special projects biodiversity conservation. In the second phase the project concentrated in three Panchayaths to come up with a more scientific plan for natural resource management. The project reviewed the existing projects specifically designed to manage natural resources and also the impact of general projects and their implementation to the natural resource management. The second phase of the project focused to develop a landscape based development plan for three selected Panchayaths of Wayanad by more grass root engagements in Gramsabhas. In nutshell the project tried to integrate sustainable land and resource management to the local level development planning.

Three Panchayath namely, Vythiri, Poothadi and Noolpuzha were proposed for the implementation of this project. But 2018 witnessed flood and landslides in Wayanad followed by heavy rains in the month of August. This actually drastically changed the development dimension and the vulnerability status of Panchayath sin the district. In this context the proposed Panchayaths were changed to Pozhuthana, Vengappally and Kottathara as they are the most affected by the extreme weather events of 2018 as the focus of this project.

Back ground

Wayanad is an ecologically fragile region in the Western Ghats with bountiful biological resources. Situated at a height of 700 to 2100 m above MSL Wayanad harbors rich diversity of flora and fauna among which many are endemics. Geographically it is a region drained by the eastward flowing Kabani. Wayanad has three rainfall zones varying from 1,200 mm eastern part and a wet south-west region receiving nearly 5,000 mm. Nearly 2,200 species of flowering plants 310 species of birds and 45 species of frogs have been recorded from Wayanad. As in the biodiversity, Wayanad is home to diverse cultures including 12 Adivasi communities. Current population of the district is 8,71,000 of which 17% are Adivasis. 90% of the population depends on agriculture for sustenance. High fertile soil of Wayanad is suitable for many varieties of crops. Wayanad has the record of 75 cultivated varieties of rice, 35 varieties of vegetables and numerous tubers.

The region is the hub of migrations from neighboring states and plains of Kerala for centuries. The recent farmer migrations from 1940 caused immense changes in the land use priorities of the district. This in turn changes the production and land relations among the communities. The changed land use patterns and intensive agriculture affected the soil health, biodiversity and micro climatic conditions of Wayanad. This affected the life, food habits and livelihood of all Adivasi communities (17% of the population) and marginal farmers (50% of the population) who are directly depend on these depleting natural resources. In the process of development the access and control over these resources are largely taken away from majority of the population who are depending on them. It led to livelihood crisis, malnutrition of

marginalized communities, climate and ecological vulnerability of the region. Wayanad as a unique ecological region demand an ecosystem based scientific natural resource management and sustainable development approach in its biodiversity governance.

The decentralized development planning of Kerala is theoretically integrated the concept of sustainability and enhancement of primary production systems especially agriculture. But Wayanad's experience of 20 years of decentralized development shows its failure to integrate sustainability in to the development planning. Considering social, ecological and geographical peculiarities of Wayanad, it is important to sensitize people and LSGS to bring sustainability in to local level development planning. As the bio-resources of Wayanad is the base of its uniqueness biodiversity governance has to be considered as a development agenda in Wayanad.

India has powerful legislations in biodiversity governance and institutional frame works to implement it. The long term experience of CAbC and the experience of out of the working with BMCs of LSGs in Wayanad in particular show the need for a more intense work to strengthen the institutional frame works under different legislations pertaining to biodiversity conservation to implement them in a meaning full manner. Awareness on ecosystem based management of natural resources is necessary for ensuring sustainable local development. Here we identify the need of translating the essence of Indian Biological diversity Act 2002 to all people's representatives and strengthening the institution frame work to implement it. Grass root awareness building and empowerment of decentralized bodies through knowledge dissemination is essential at this stage to ensure effective implementation of the legislations with the objective of participatory Biodiversity governance. This project tried to generate a dialogue among local people and people's representatives on the need of a scientific land use and natural resource management plan for each Panchayath.

The project

This one year project aims to assist the implementation of biological diversity Act 2002 in Wayanad district of Kerala. It is important to strengthen the institutional frameworks to ensure effective implementation of the act. The role of Panchayath level BMCs are very crucial for successful implementation. The baseline study done by MSSRF on the functioning of BMCs shows a clear need of empowering them to take the leadership of biodiversity governance at local level. Apart from this the idea of sustainability and scientific natural resource management has to be integrated to the local level development agenda.

The prime interest of this project is to empower the local self governments to take decisions on biodiversity governance through awareness building on existing legislative frame works in India.

This project specifically intents to build awareness of the people at grass roots on the need of sustainable biodiversity management and to integrate that in the local development planning.

The project will also assist the local decision making bodies to develop local development plans with a scientific natural resource management.

The completed year is the second phase of a larger project spread over a period of 5 years. First phase was to sensitize all Panchayath board members of Wayanad on BD act 2002 and its institutional frame works

marginalized communities, climate and ecological vulnerability of the region. Wayanad as a unique ecological region demand an ecosystem based scientific natural resource management and sustainable development approach in its biodiversity governance.

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to implement it. The sensitization process is designed in a participatory mode to probe the community need of biodiversity governance and to come up with one specific project from each Panchayath. These model projects will demonstrate the biodiversity management under BMCs in each Panchayath.

The second phase is focusing on developing a landscape based natural resource management plan for three Panchayaths of Wayanad by more grass root engagements in Gramsabhas. By this stage the project developed a scientific natural resource usage plan for each Panchayath with specific land use priorities. By 2021 the second phase of the project is completed.

The third phase of the project will assist the selected three Panchayaths to develop and implement more sustainable development plans using the resource use plans developed in the second phase. At this stage the project will work with Gramsabhas and working groups in the Panchayath to support them in the planning process. Along with this more specific long term projects with special focus on biodiversity conservation and sustainable livelihood will also develop for different wards in the Panchayaths. As Wayanad is an agrarian district climate smart agriculture with special reference to soil and water management will be the focus of these projects. Management of human animal conflict is another possible area of long term intervention. Integration of traditional knowledge of different Adivasi and agrarian communities to the development planning will also be ensured.

In nutshell the project tried to integrate sustainable resource usage and biodiversity conservation to the local level development planning and to develop sustainable decentralized development models for biodiversity governance.

Objectives

1. To empower the BMCs as a body taking lead role in sustainable biodiversity management
2. Develop plan and implement at least one special project in the area of sustainable biodiversity management under BMC.
3. To monitor the resource use pattern of local development plans of the respective Panchayaths.
4. Integrate a landscape based natural resource management approach to the local development planning.

Activities

Phase II

Awareness building on BD act and selection of sample Panchayaths

As a project induction programme we have conducted one workshop to all Panchayath BMC members of the district that we were working in the first phase of the project. This workshop designed as refreshment training for the BMC members on Biodiversity Act 2002 and its implementation. The BMC members together rank the vulnerabilities of Panchayaths in the participatory exercise as part of this

workshop and selected the three Panchayaths where the second phase of the project has to be implemented.

The topics covered under the awareness session of the workshop are;

1. Need of integrating sustainable natural resource management principles in to local level development planning. Present status of natural resources and usage pattern in respective Panchayaths (Water, land, forest, biodiversity etc.) Responsibilities and powers vested in Local self governments in natural resource management.
2. Awareness building on Acts, Rules and institutions pertaining to the Conservation of Biodiversity at large.
3. Awareness building on the Indian biological diversity act 2002, Rules, and institutional frame work to implement the act (NBA, SBBs, BMCs).
4. Roles, responsibilities and scope of BMCs in local level sustainable development.
5. Scope and use of PBR in local development and in protecting community rights on biological diversity (IPR, access and benefit sharing).

In the workshop the participants rank the Panchayath using the criteria such as biodiversity richness, forest presence, presence of high elevation mountains, slope, presence of water bodies, and presence of origin points of rivers, diversity of ecosystems within the Panchayath Boundary, wetlands, flood incidents, landslide incidents, flood prone areas, land slide prone areas and livelihood profile of the people.



After discussing these ranking points the workshop selected Pozhuthana, Vengappally and Kottathara as Panchayaths to implement the project. Pozhuthana got high ranks in all criteria as it

is rich in ecosystems biodiversity and prone to flood as well as landslides. The livelihoods of the people of Pozhuthana as farming community and plantation labourers are also highly dependent on the natural resources and climate. Koottathara is a panchayath with high tribal population, completely agrarian economy prone to flood and landslides. Vengappally is a small Panchayath in between the two Panchyathas with complete farming community. The project has decided to select the three Panchayath situate on the banks of two main tributaries of Panamaram Puzha Valiyapuzha and Cheruyapuzha as a geographic unit.

Grass root initiatives at the selected three Panchayaths

The project to induct a landscape based natural resource management approach to the local level development planning with due consideration to Biodiversity conservation. The grass root activities were planned in three levels,

Participatory Mapping and documentation of all existing projects and programmes in line with conservation and evaluate their impact on the natural resources of the Panchayath (Water, land, forest, biodiversity) (make use of Panchayath resource maps, PBRs and data from land use board)

Analysis of changing patterns in resource usage in the Panchayath (Water, land, forest, biodiversity)

Developing a land use plan, water management plan and biodiversity management plan with special reference to traditional agricultural sites for the selected Panchayaths



The project mapped all development activities involving any kind of conservation elements through participatory exercises conducted among the selected Panchayath members, BMC members and working group members. These exercises has given special references to activities undertaken with in the schemes of NREGs, Haritha Kerala mission the mission activities devised by Kerala Government to boost sustainable management of water sources, waste management and biodiversity conservation and the special project implemented by direct supervision of Kalpetta

MLA Called *Pachappu* with special interest to rejuvenate the natural systems and to boost local production system. These exercises have conducted in all three selected Panchayaths and then repeated the same in selected two *Gramsabhas* of each Panchayath. Thus we have conducted six participatory exercises with Panchayath representatives and another six with people at grass root at the *Gramsabhas*.



This participatory process was a collective learning of current status of natural resources, usage pattern and its distribution and impact of different projects and programmes on it. This helped the people involved in the planning

process with more specific knowledge on the resources that they are going to use. This process helped the participants to think about the need of more projects with specific objective of sustainable management and equitable distribution of land water and biodiversity. This again reemphasized the role of BMCs in designing special projects and also monitors sustainability aspects of the development projects within each Panchayath.

Results of participatory learning

Pozhuthana

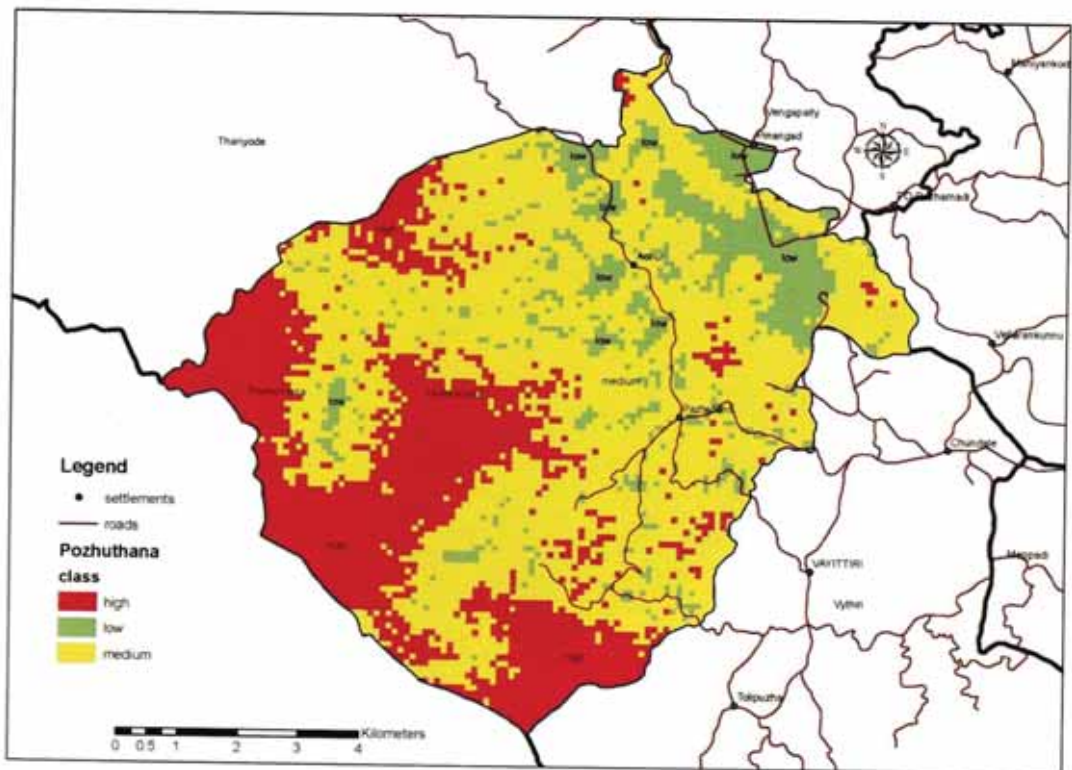
Pozhuthana Panchayath is located in the western side of Wayanad bordering with the Kozhikode district. It is undulating in terrain with Western ghats mountain ranges in the western side and slopping towards the east. Total area of the Panchayath is 71.30 sqKM. It has a total population of 18404 of which 8852 are men and 9552 are women. Scheduled tribal communities contribute 3262 people and about 1220 are scheduled caste people. The Panchayath is divided into 13 wards. The elevation starts from 700 meter to 1600 meter in Kurichyarmala regions. There are numerous streams that originate from these forests and join the river Kabani. Kurichyarmala, Vannathimala and Sugandhagiri regions are hilly in terrain with exceptional biodiversity.

About 700 acres in the Panchayath falls under forest area. Elephants, Wild guar, tigers and leopards are recorded from these forests. Endemic Birds such as Wayanad laughing Thrush, Nilgiri Flycatcher, Malabar Barbet etc. The Panchayath also has a good area under tea plantation started during British period. Apart from this Coffee, Cardamom, coconut, Arecanut, Rice and Banana are cultivated in the Panchayath. Rice farming has been reduced to merely one *Padasekaram* in recent years. 30% of the land area of the Panchayath is under Plantation area.



The Panchayath receive high rainfall and many mountain slopes are prone to landslides. In the year 2018, excessive rainfall during the monsoon in the mountain ranges resulted in a massive landslide resulting in loss of several houses and properties. The area is still prone to landslides and many families are relocated from the location. But still many are continuing their stay and farming at the risky slopes. Apart from the locations where the slopes slid due to heavy rains in last two years, the western side of the Panchayath as a whole is prone to landslides as they are part of Western Ghats with high elevation mountain slopes. As the climate predictions warn the possibility of extreme rainfalls in the mountain ranges the scientific management of these land use unit is very important for future development of the Panchayath.

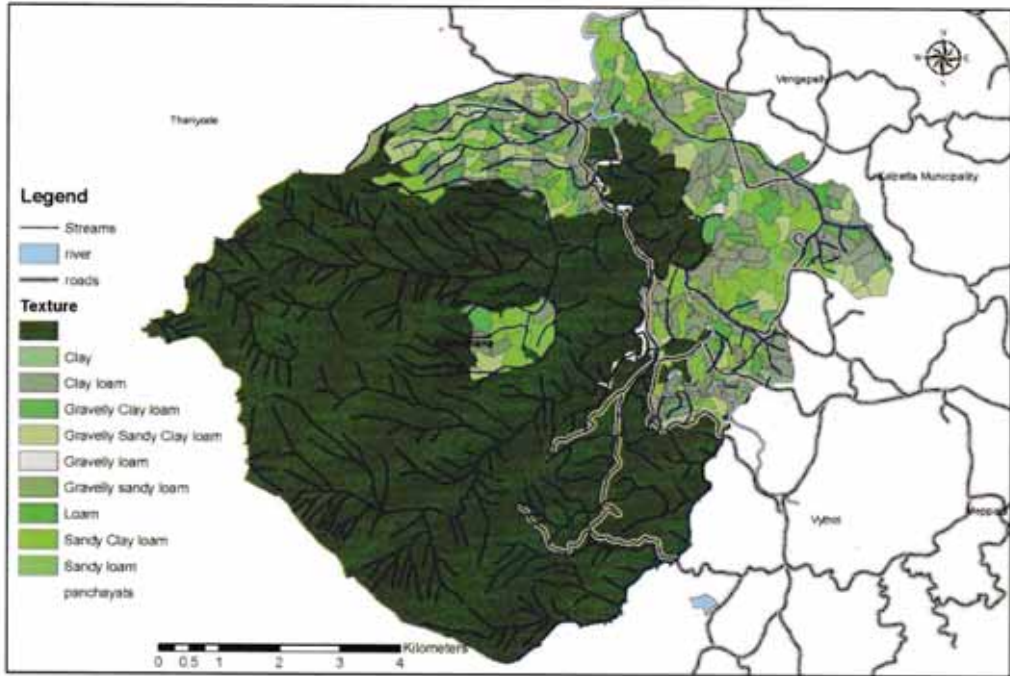
The land use pattern of this region is mostly degraded forest in the mountain tops, plantations in the low elevation slopes and fragmented farm lands with coffee, mixed crops in the low elevation regions and banana in the wet lands. Private land in the high elevations are highly fragmented and thickly populated with booming construction of houses. This land use pattern is not at all suitable for a highly vulnerable area like this.



Map 1: Land slide susceptibility map of Pozhuthana Panchayath (Vishnudas et al. 2019)

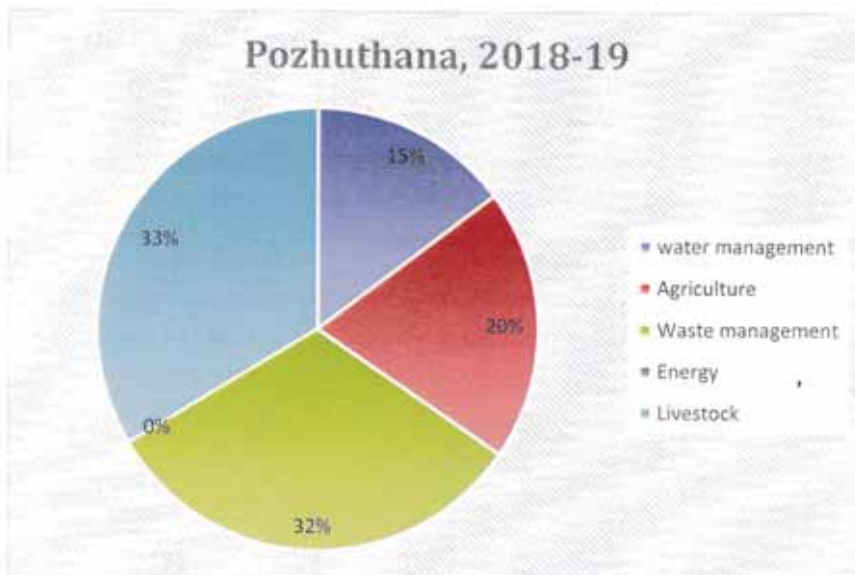
The geography of Pozhuthana is also characterized by multiple soil types, high density of streams with specialized vegetation in the banks. The wetlands are mostly converted in to Banana farms or housing areas the river mapping done with the support of students of Achooranam school shows that more than 55 percentage of the original vegetation along the riverside is transformed due to much type of human interventions.

The map below shows the soil types streams and road network of the Panchayath. It is evident that majority of the land area of the Panchayath is coming under Either Forest or Plantation area where the data on soil type is not available. And also the Map shows the multiplicity of soil types with in a small region and numerous streams. Any further development in this region has to consider these peculiarities of the land and should include measures to conserve its original vegetation.



Map showing Soil type and streams of Pozhuthana
(Generated out of the data from Land use board)

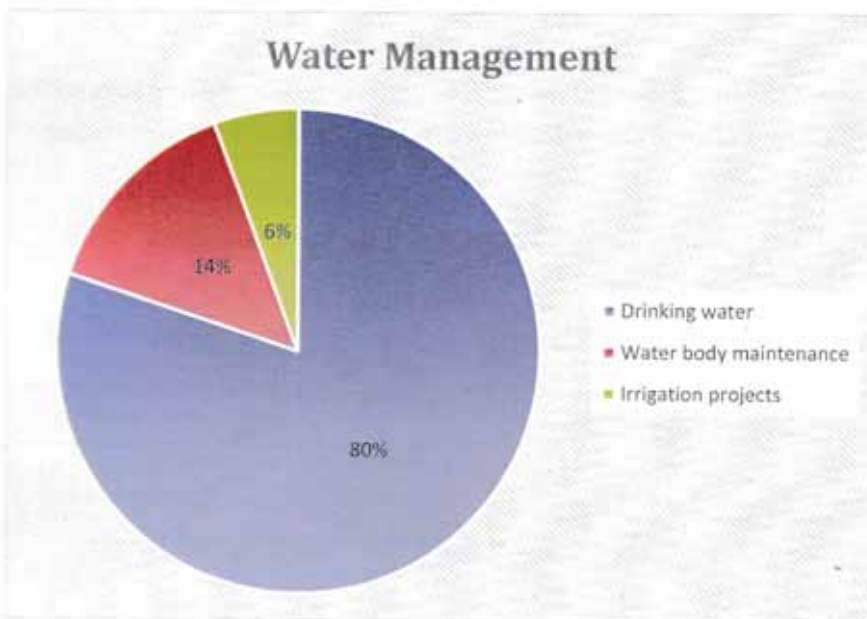
Analysis of Natural Resource Management projects implemented by the Panchayath



In the next step the project analyzed the development projects implemented by the Panchayath for the financial year 2018 - 19 with the objective of natural resource management. From the whole list of projects and money allocated to each sector the group found out water management, Agriculture, Waste management, energy

and livestock are the sectors coming under natural resource management. See the chart given below to show the distribution of fund allocation to different sectors under natural resource management.

In the natural resource based activities done by the Panchayath, the distribution of fund to waste management and livestock projects are almost same. 20% in Agriculture allotment followed by



15% in water management. 2018 was the flood affected year. Hence a major share of fund has been allocated in livestock for conducting poverty alleviation activities. No programmes related to energy. It is evident that waste management and livestock are the priority areas of the Panchayath in the selected year of

analysis. It is mostly influenced by the state priority to waste management and through the mission activities of Haritha Keralam. The second area of priority is agriculture. Within agriculture the Panchayath allotted majority of fund to distribution of seeds and seedlinks of vegetables. The subsidy paid to rice farmers in Pozhuthana is nominal as the rice cultivating farmers are very less in the Panchayath. Within the water management cost only 14 percentage is used for water body maintenance. See the chart given below:

The major concentration is on drinking water projects (80%) followed by water body maintenance (14%) and irrigation (6%).

The analysis shows that there are no specific projects planned or implemented by the Panchayath exclusively for biodiversity management. There is one project implemented by Kerala State Biodiversity Board through the Panchayath BMC to conserve and value adds selected medicinal plants in the Panchayath. The combined intervention of *Swatch Bharath* mission and Haritha Kerala Mission a waste management plan has developed and formed Haritha Karma Sena led by women. They are also involved in the installation and distribution of bio gas plants and compost bins to selected beneficiaries. Toilet construction under the targets of *Swatch Bharat* mission programme was also another focus.

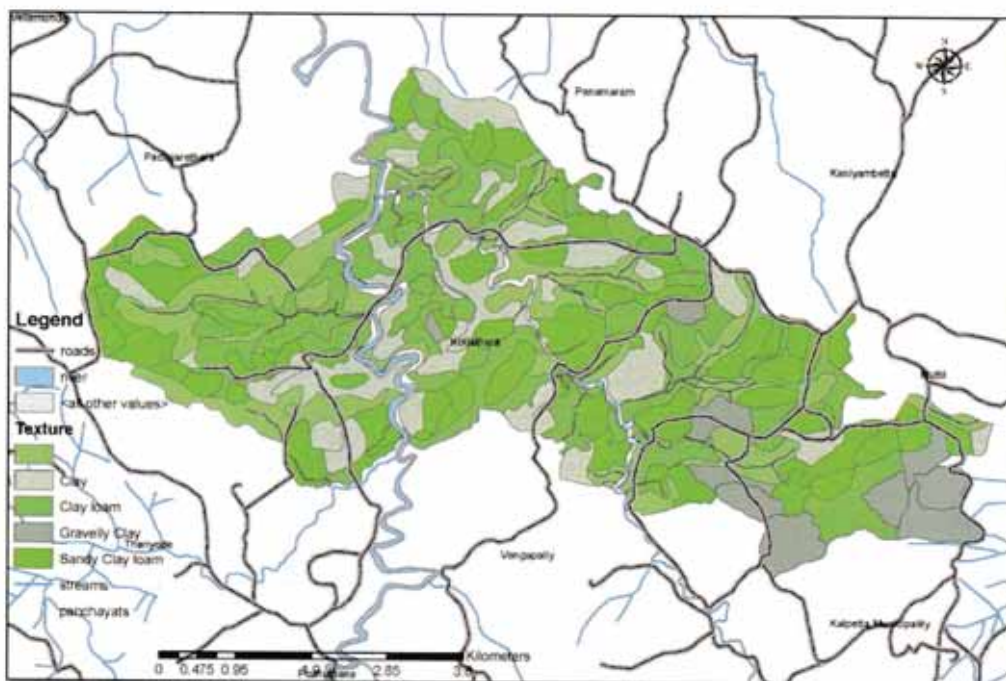
Recommendations to sustainable natural resource management Plan

1. Pozhuthana has six main rivulets flowing from high elevation mountains through the steep slopes of mountains. All these rivulets including their streams has to be protected from river bank erosion.
2. The natural ecosystems of each rivulet has to be rejuvenated and conserved with long term plan and fund allocation.
3. The high elevation mountain stability is depend on the land management at the foot hills so the tree cover that lost during the last several decades need to be restored to ensure stability during extreme weather events.
4. The construction in the hill tops has to be regulated and the and cropping pattern in the hill slops has to be planned scientifically with long tern crops.
5. The downstream wetlands and rice field s need to be managed for absorbing the excess runoff during heavy rainfall.
6. Road networks through the wetlands need to be reexamined to ensure free flow of runoff water during floods
7. The lost wet lands of Pozhthana has to be rewamped through high support to rice farming.

Kottathara Panchayath

Kottathara Panchayath is located in the central region of Wayanad. It has a total area of 31.75 sq Km. It has 13 wards. Kottathara Panchayath is generally an agriculture region mostly cultivated with Rice and Banana in wetlands and coffee, Pepper and other mixed crops in the dry lands. Elevation ranges from 700 to 950 meters. There are two major rivers flowing through the Panchayath namely Valiya Puzha and Cheriya Puzha, both drains into Kabani. The Panchayath has a predominant population of tribal communities such as Paniya, Kurichya etc. The Panchayath has a small area of forest in the eastern side close to Madakkimala. Kottathara Panchayath is also having good biodiversity including many small mammals such as civets, mongooses, Langur etc. The low elevation wetlands of Kottathtara, the flood plains of Valiyapuzha and Cheriyaapuzha are flood prone region. It constitutes a major portion of the Panchayath. The Panchayath has been worse affected by the floods of 2018 and 2019 and it continues in the year 2020 as well as it situated in the middle part of Wayanad and laying low elevation among the two rivers that carries a major chunk of water from the hills to the Panamaram Puzha.

Kurumbalakotta the small hillock situated in the boarder of Panamaram and Kottathara Panchayath in an important landmark of the region. This hillock is inhabited by many families in its slops and barren in the top. The hill with ample biodiversity and scenic beauty is an emerging



**Soil types, river and road networks of Kottathara Panchayath
(Generated out of the data from Land use Board)**

The small hillocks surrounded by network of wetland tracks are the characteristics of the Panchayath. As a sparsely populated region and presence of small plantations and traditional farming communities the rate of land fragmentation is less in Kottathra compared to neighboring Panchayaths. But the eastern sides of the Panchayath witnessing fast changes and increase in built up areas. The pattern of land use in Kottathara is given in the map below. Management of flood plains and support to traditional agriculture is the areas where the Panchayath need attention.

The Panchayath BMC is not evolved in a way to involve themselves in the planning processes of the Panchayath. The Panchayath has the legacy of preparing its biodiversity register long before the enactment of Indian Biological Diversity Act with the help of M. S. Swaminathan Research Foundation. But the recent Panchayath board has not conceived that importance to the functions of BMCs biodiversity management as a whole.

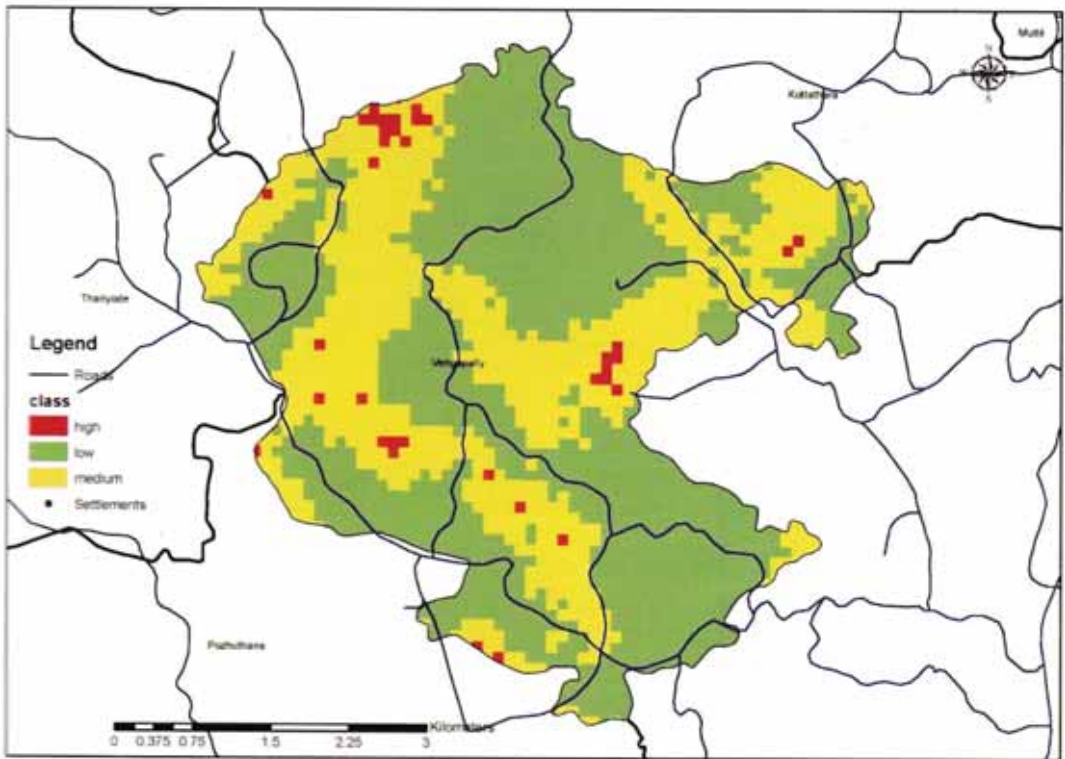
Recommendations to scientific natural resource management

1. Kottathra is a Panchayath with high percentage of tribal population and farming communities. More focus needed to primary production system like agriculture.
2. As it is a highly flood prone region the cropping pattern of the Panchayath has to be scientifically planned
3. The flood resistant crop and varieties has to be promoted in the Panchayath
4. A proper management plan has to be developed for the land slide prone hillock of Kottathra called Kurumbalakotta.
5. The tourism activities going on in the hill has to be regulated and designed a s community tourism model which support farmers and biodiversity conservation efforts
6. Kottathra need special attention to its tribal hamlets use to flooded every year. As the pattern on climate change warns more intense rain falls in the future years, safe residential arrangement for regularly flooding hamlets should be the priority of the Panchayath
7. The flood plains of both the rivers have to be protected by planting native riverine tree species.
8. The vast wetlands along the flood plains of the rivers have to be managed in a way to maximize its ecosystem services by promoting wetland paddy cultivation.
9. The increasing trend of land fragmentation of land and booming of constructions and houses and other commercial buildings has to be has to be arrested through policy interventions.
10. Sustainable construction models has to be promoted in the Panchayath for all buildings

Vengaplli Panchayath

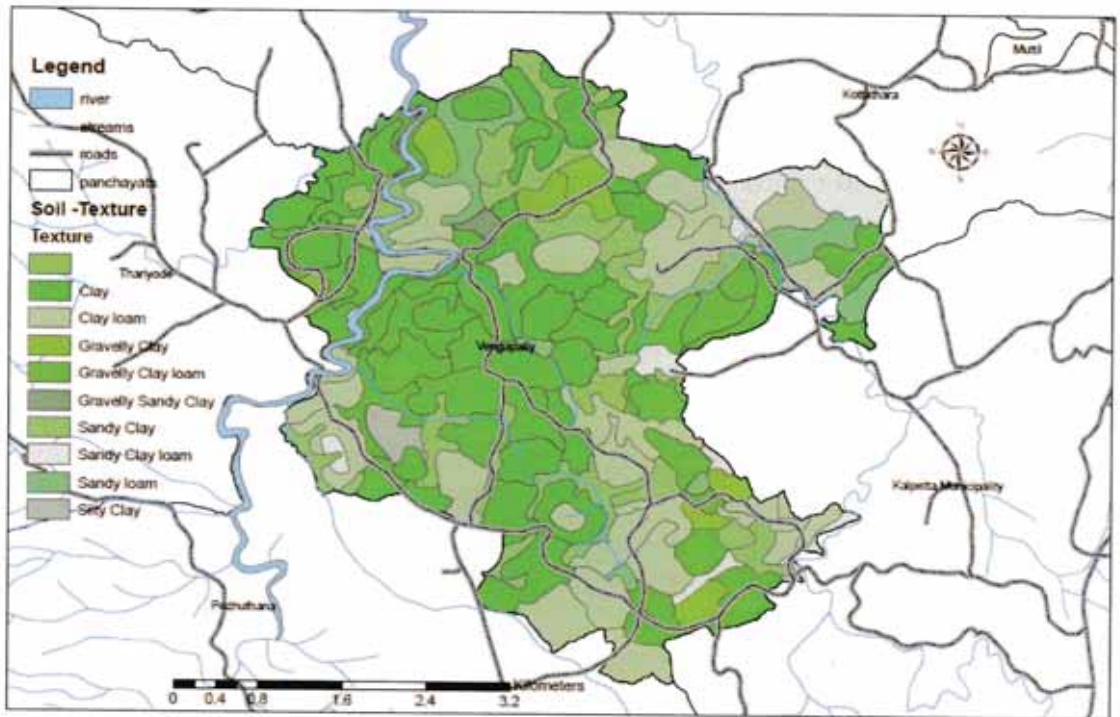
Vengapalli Panchayath is located in the central region of Wayanad. It has total areas of 21.26 sqkm. It is one of the smallest Panchayath of the state. Average elevation is about 700 meters. It has 13 wards. General topography is undulating with hills and valleys. Vengapalli has a total population of 12000 of which 2977 are Tribal people. People of the Panchayath generally depend on agriculture and livestock for livelihoods. Coffee, Pepper, Coconut, Rice and Banana are cultivated in the Panchayath. However, price fall of crop produces, climate change impacts are strongly affecting the local economy of the Panchayath. There are no forest patches in the Panchayath, but there small are coffee estates that act as forest ecosystems. The Panchayath is drained by the Valiyapuzha and Cheriya Puzha that joins Kabani.

As the Panchayath is located in between the high elevation mountain ranges of Pozhuthana and the lower regions of Kottathra is generally a flow path of Pozhuthana river, which flows through its boarder. Annual floods lasting for hours were a regular phenomenon in the region. But from 2018 onwards the wetland farming of rice, the management of crops like pepper coffee and all are under threat. Farmers are facing crop loss due to heavy rains and economic distress followed by that. As the terrine is undulating in nature with low elevation hills and wet lands the landslide susceptibility of the region is comparatively low. But while comparing with other Panchayaths in eastern parts of Wayanad a major land area of Vengappally is moderately susceptible for landslides.



Land slide susceptibility Map of Vengappally (Vishudas et al. 2019)

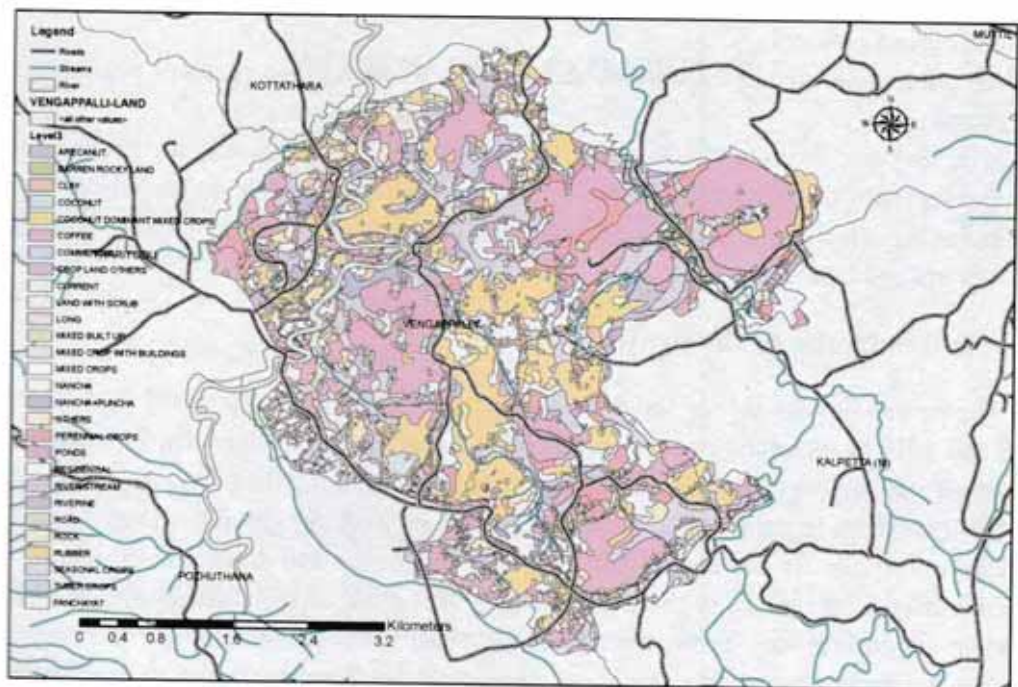
The Map below shows the soil types river and road networks of Vengappally Panchayath. It shows the predominance three types of soil in the Panchayath and comparatively less dense network of streams. As an agrarian region a timely land use plan will help the Panchayath to be projected as a model for sustainable natural resource management and biodiversity governance.



**The Soil type, River and Road Networks of Vengappally Panchayath
Generated out of the data from Land use Board**

The mixed land use Pattern seen the map below narrates the rate of fragmentation in the region. As the population is completely small scale farmers who cultivate multiple crops the land use and cropping pattern is so diverse. Some farmers are following multiple cropping but some of them are mono-cropping. A considerable area has seen converted to rubber plantations. The conversion rate of wetland paddy lands to Banana and to build up area is also high in the Panchayath. The climatic and economic crisis faced by small farmers is reflecting in the land use pattern of this region. Strong government support to rice farming, scientific intervention on developing climate resilient farming system is important for the Panchayath.

The construction of new roads buildings without considering the nature of this undulating landscape and water cycle impacts the biodiversity and productivity of this area. The emerging trend of big houses and fragmentation of farmlands due to population growth is also effecting total natural cycles of the region. Vengappally is a Panchayath where numerous quarries are working. Many of them are threat to the local ecosystem and living of people. But as the region does not have and forest area the current regulations are not enough to control them. Panchayath rather negotiated with the quarry owners and channelized their Corporate Social Responsibility fund to build a new Panchayath office building.



Analysis of Natural Resource Management projects implemented by the Panchayath

This exercise is conducted at the Panchayath office with the attendance of BMC members and Panchayath Ward members. Vengappally also spent above 60 percentage of their plan fund which has been utilized for any kind of natural resource management in the sector of agriculture. A major chunk of the money within the agriculture is set apart for subsidy to rice farming, distribution of vegetable seedlings goat rearing etc. Water management under the NREGA is a major work taken over by the Panchayath. Under the NREGS they constructed temporary check dams in 5KM inter well all along the river. There are not much projects designed by the Panchayath for biodiversity management and other aspects of natural resource management.

Recommendations to scientific natural resource management

1. NREGA scheme should be linked to agriculture sector, so that it can support farmers who are in distress to save their operational cost and increase their margin.
2. Since agriculture is the prime sector of the Panchayath, it need to be supported with long term production plans
3. Rice cultivation should be supported with eco-system service subsidies

4. As it is a developing Panchayath the Panchayath can adopt the plan for developing sustainable habitat, giving guidelines to convert each household a sustainable house with clear green protocol.
5. All public and private institutions should work under a green protocol published by the Panchayath.
6. Wet land rice farming has to be given more support. As the season of rice farming is altering with the changing climate events a scientific planning is needed in this sector including selection of seeds, mechanization, crop calendar and developing new skills to farmers and laborers.

The overall outcome of the project

The project has not able to finish in the time frame planned in the initial year. The floods of 2018 and 2019 changed the overall development focus of the Panchayaths. The planning and development atmosphere completely shifted its focus to revamping the economy from the losses due to flood and then to the disaster management. A new working group has been formed in all the Panchayath to discuss and plan biodiversity climate change and disaster management with a clear demarcated plan budget of three percentages. But most of the Panchayaths and the state government in general also given high priority to the disaster management element in this budget. So the project team also forced to work with the Panchayaths to plan the relocation schemes of families from landslide effected locations and flood prone regions. Even in the special *Gramsabhas* conducted for the purpose of this project people where more vocal about the immediate remedy to their sufferings in recent floods and landslides.

As a result the project team actively involved in all three Panchayaths to develop their disaster management plans with emphasis to the rebuilding the natural ecosystems of the region. Pozhuthana and Kottathra Panchayaths lead the relocation plans in the district. They could pool money from different schemes and programmes to relocate almost 90 percentages of the affected families to safer places. The project played an active role in developing projects and to bring in effective collaborations and linkages.

Pozhuthana Panchayath has done an evaluation of 25 years of their decentralized development intervention in the frame work of Sustainable Development Goals and come up with a report in collaboration with a popular people science movement of Kerala KSSP. Kottathra Panchayath has developed a project to rejuvenate the lost breeding sites of herons in their Panchayath and implementing now. Vengappally could not come up with a concrete project but cold influence the Panchayath planning to expand their support to rice farmers and then to increase the area of rice farming in last two plan period.

In nut shell the project could bring good understanding among the local planners and people about the need of a biodiversity based planning in coming years. The project could generate a

discussion among the Panchayath member and BMC members on the need of an alternative thought in development planning processes.

STATEMENT OF EXPENDITURE

Particulars		Amount
Sanctioned amount		440,000.00
Less: Expenditure:		
Human Resource	256,794.00	
Participatory Mapping and Learning Exercises	56,472.00	
Documenting, Printing & Stationery	3,428.00	
Travel	42,874.00	
Subject Expert Fee	10,000.00	
Purchase of Maps and other resources	40,000.00	
Workshop to develop resource usage plans	18,810.00	
District level workshop to share the results with other Panchayats	2,640.00	
		431,018.00
Balance		8,982.00
Contributions received	330,000.00	
Less: Expenses	431,018.00	
Closing balance	(101,018.00)	