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Ministry of Agriculture
கமத்தொழில் அமைச்சு

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விவசாய நவீனமயமாக்கல் திட்டம்
Agriculture Modernization Project

ENVIRONMENTAL SCREENING REPORT

Subproject title: Dried Chilli Production and Value addition under Lift Irrigation Schemes in Batticaloa



Sri Lanka Agriculture Sector Modernisation Project (ASMP)

Prepared for Project Management Unit of the Agriculture Sector Modernization Project

Democratic Socialist Republic of Sri Lanka, Ministry of Agriculture (MOA)

Updated: February 2022

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ABBREVIATIONS

ASMP	Agriculture Sector Modernization Project
DSD	Divisional Secretary Division
EMP	Environmental Management Plan
GND	Grama Niladari Division
LKR	Sri Lanka Rupees
MOA	Ministry of Agriculture
PMU	Project Management Unit
WQI	Water quality index
RDS	Rural Development Society
WRDS	Women Rural Development Society

Agriculture Sector Modernization Project

Environmental Screening Report

PROJECT IDENTIFICATION

Project title	Dried Chilli Production and Value addition under Lift Irrigation Schemes in Batticaloa
Project Proponent	Agriculture Sector Modernization Project (ASMP), Ministry of Agriculture

PROJECT LOCATION

Location (*Relative to the nearest town, highway*)	Batticaloa district is subdivided into 14 Divisional Secretary Divisions (DSDs). Each DSD is again subdivided into several Gram Niladari Divisions (GNDs). The total number of GNDs is 345. Each GND consists of several villages. There are 965 villages in the district. The local authorities comprise one Municipal Councils in Manmunai North, two Urban Councils in Kattankudy and Eravur Town and eleven Pradeshiya Sabas. Proposed project has selected farmlands across 8 villages and 6 out of them belong to the Manmunai South & Eruvil Pattu (MS&EP) Kaluwanchikudy DS division while two villages belong to the Manmunai Pattu (MP) - Arayampathy DS division. The project includes establishment of dry chilli cluster, establishment of Elephant fence and construction of Collection, Processing and compost yard. However, this environmental screening report is prepared only considering the establishment of dry chilli cluster. Collection, Processing and compost yard and Construction of Elephant fence will be addressed separately. Manmunai South & Eruvil Pattu (MS&EP) Kaluwanchikudy DS division has 45 GN divisions and this selected project locations are scattered in six villages namely Kaluthavali, Thetativu, Mankadu, Chddipalayam, Mahiloor and Kurukkalmadam. Manmunai Pattu (MP) - Arayampathy DS division has 27 GN divisions and project locations are distributed across two villages namely Kirankulam and Puthukudyruppu. All selected farmlands are private farmlands and either deed or permits available. The selected lands for the cluster is accessible via A4 Colombo-Batticaloa Highway in Mankadu. These lands are located about 5km away from Kaluwanchikudi township and about 20km from Batticaloa township. Few random locations of these farmlands are shown in Figure 2.

Figure 1: Random farmlands

Definition of Project Area

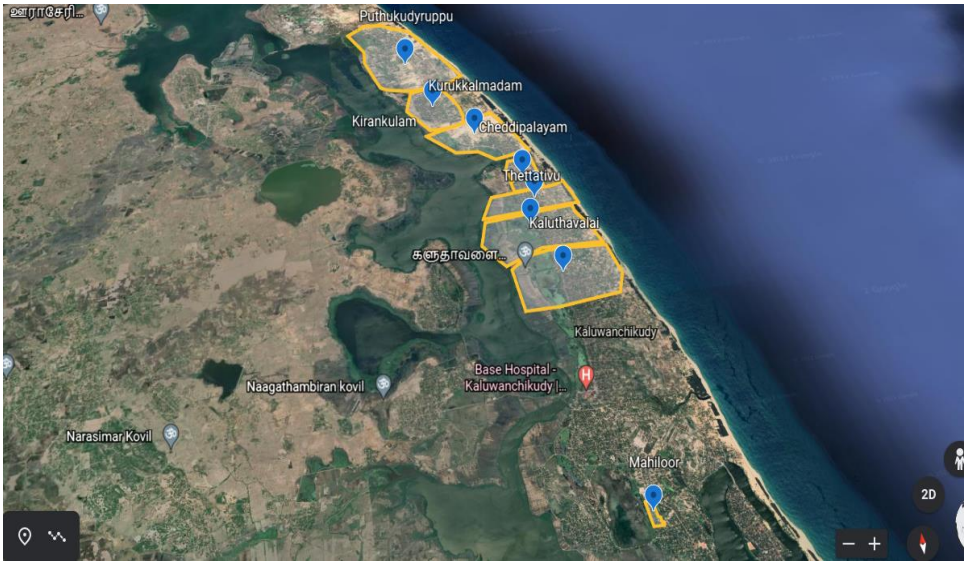
(The geographical extent of the project & areas affected during construction)

Batticaloa is an agricultural economy-based district and rice production is the main agricultural activity undertaken by farmers in lowlands. The agricultural lands are the second largest land use cover of the District. Major land uses and land cover in the district are forests, agriculture, home gardens and water bodies. The rest of the land covers by the home Garden, water bodies, wetlands and Non-Agricultural lands.

The minimum requirement to be a beneficiary is having 0.5 acre land for the chillie cultivation and rest of the beneficiary selection criteria to be met as per the selection comity recommendations. Selected beneficiary list is shown in annexure 3. All these beneficiaries are entitled for the processing centre benefits as well.

The project is aiming minimum of 50 acres (100 farmers) of chillie cultivation and farmlands are located scattered in two DS divisions namely Kaluwanchikudi and Arayanpathy. Technological support including drip irrigation technology will be on the farmlands itself. Most of the farmers use water from minor tanks and open wells for the existing cultivation and water resources will not be changed with the implementation of the dry chilli cluster. Further, additional water extraction sources will not be funded under the project instead of drip irrigation technology. It is estimated that drip irrigation will also help reduce the use of Irrigation water by more than 50% of the traditional cultivation practice requirement.

Kaluwanchikudy and Arayampathy DS division armers cultivate paddy on lowland in one term (Maha Seasons) per year. During Yala season (May to August), cultivation activities are limited to paddy on lowlands and upland seasonal crop cultivation is dominant. Farmers use water from minor tanks and open well for the cultivation purposes. Farmers have cultivated perennial crops such as coconut and mango on upland for their household consumption. Since it is receiving high rainfall during Maha season (September to March), some farmers are cultivating seasonal crops on

	their uplands. During Yala season, seasonal crops such as ground nuts, Chili and varies vegetables are cultivating by using open well/tube well water. However, open well/tube well water is not sufficient to cultivate their entire land and most of the time only around 0.5-1 acer is cultivated. However, project selects farmers only having water sources for the cultivation. Only the farmers already having perennial water source will be eligible to be a beneficiary of the proposed project. Proposed project beneficiaries are selected based on the availability of water and new extractions will not be allowed to be a part of the project. Total Land area of the Arayampathy DS division is around 32 km^2 and two villages were selected for the project. Total population of the Arayampathy DS division is around 38,405. Six villages are represented from the Kaluwanchikudy DS division and total land area 52.5 km^2. Total population of Kaluwanchikudy DS division is around 70,000. The highest population of the Arayampathy DS division is belonging to the Palamunai GN division while Kaluwanchikudy south is from the Kaluwanchikudy DS division. Hindu community is common to the both DS division and it is around 95% in the Manmunai Pattu & Eruvil Pattu DS division while Manmunai Pattu DS division represent around 67% of the total population. Selected villages are shown in figure 2.  ***Figure 2: Selected villages***
Adjacent land and features	Batticaloa District situated in the central part of the Eastern province in Sri Lanka is bounded at the North by Verugal Aru & Trincomalee District, at the West by Polonaruwa District at the south by Ampara District and at the East by Indian Ocean. Batticaloa is the major city in the Eastern Province. The total land area of the District is approximately 2,482 square kilometers. Major land uses and land cover in the District are forests, agriculture, home gardens and water bodies. Forest covers 41% of the total land area and the agricultural land covers 37% of the total land area in the District. The rest of the land covers by the home Garden 5%, water bodies 5%, wetlands 2% and Non-Agricultural lands 5%. Other Land types such as Vacant Lands,

	Unproductive Lands, Sandy Area, Rockout crops etc. cover around 6% of the total land area. Agricultural activities include paddy cultivation and high lands are used for seasonal crops such as groundnuts, chili, long bean, and several cereal crops. Further, perennial crops such as Palmyra, coconut, Cashew are found within the selected area. In addition, it was observed that many Adathoda and some native species such Kohomba, Murunga, etc. All selected farmlands are presently cultivated by farmers and seasonal crops are commonly found. Almost all the villages are bordered to Coast and cultivation lands are about 200m landward which are been cultivated at present.

PROJECT JUSTIFICATION

Need for the project (*What problem is the project going to solve*)	Chilli production is very low in the drier months of May, June, July and again in the rainy days of November, December and January. During dry period production is affected due to extreme heat causing stress to the plant which in turn reduces the fruit set. Further, the presence of peak insect pest population during the months of May to July also makes the plants less productive. Flower drops is very high during rainy season and the wet conditions is more favourable for many fungal diseases leading to loss of production. The technology package of insect proof net and poly mulching along with drip irrigation technology system would overcome the losses caused by biotic and abiotic stresses especially during drier months. The hybrid chilli variety MICHHY1 introduced by Department of Agriculture is fairly resistant to the leaf curl complex disease which is the major cause for production loss and also other technical constraints encountered in chilli production. Further, it provides an enhanced yield of more than two to four times compared to other normal recommended chilli varieties. Thus, project will use this hybrid chilli variety for dried chilli production to enhance proactivity and reduce losses The new technology package for dried chilli production is more remunerative than the conventional dried chilli production. This will pave way for a chilli-based agribusiness to commercialize agriculture in Batticaloa district. However, this new technology package requires high initial cost and also a farmer group with entrepreneurship attitude. The project will assist to build up these physical and human capacities for the selected two DS divisions for an intensive chilli cultivation and marketing practices. Chili is one of the most important cash crops in Batticaloa farmers. However, farmers' chilli cultivation is mainly meant for green chilli production and dried chilli production is very much marginal. Thus, self-reliance on dried chilli production is important for the country.

	The immediate objectives of the modernization are to increase productivity, decrease cost of production, improve value addition and provide steady market through buy back agreement. The ultimate goal is increased income and employment opportunity in production and value addition. These selected farmers have prior experience in dried chilli production and marketing and each farmer has adequate land for commercial the cultivation. High yielding Hybrid chilli seeds are locally available, and Batticaloa district farmers have good market access than the other northern districts. Further Year-round water availability for continuous cultivation is key factor to commence the dry chilli cluster at selected villages. With the dry chillie cluster project will cultivation overlaps with offseason, higher price may provide more margins to farmers. Farmers will be able to access export market for the value-added products and prevailing dried chilli import restriction could provide a ready market for local production. All above benefits are directed towards the sustainable income of the farmers. In addition, below objectives to be achieved to increase economy of selected farmers. a. Create competitive market for the value added products b. Increase young generation involvement for seasonal crop cultivation c. To introduce and demonstrate efficient and effective water d. management in dried chilli production e. To organize farmers for group marketing and value addition The said compost unit will help the societies to produce their own compost on commercial basis and sell it to the membership for a fee making it as viable business.
Purpose of the project (*What is going to be achieved by carrying out the project*)	Dried Chili production and value addition under the lift irrigation schemes project in Batticaloa is driven to achieve below objects. a. To expand national dried chilli production b. To introduce and demonstrate new technology for enhanced productivity and value addition in chilli production c. To organize farmers for group marketing and value addition d. To disseminate of modern technology in dried chilli production and marketing among other surrounding farmers. e. To introduce an environment friendly sustainable dried chilli production system To achieve these objectives, Project will provide each selected farmer ½ ac technology package consisting of insect proof net, Drip Irrigation system, GI pipes to erect the insect proof net surrounding farmer field, polymulch, seedling trays for raising nursery plants and MICHHY1 variety hybrid chilli seeds for the farmers to commence cultivation in November, 2021. Electric drier provided to the society will be used to dry the ripen

	fruit for uniform drying and appearance. This will reduce the cost of manual sun drying while increasing the quality. With the above-mentioned technological support, below benefits will be there in addition to the project objectives. a) In Chilli cultivation, nearly 60% of cost of production is spent on labour. Labour intensive operations like land preparation, irrigation, weeding, spraying, harvesting and drying. Use of modern technology like drip irrigation, insect proof net poly mulch, electric dryer will reduce use of labour in labour intensive operations b) Further fertilizer use can be minimized to 10-20 % due to drip irrigation. Drip irrigation will also help reduce the use of Irrigation water by more than 50% of the traditional cultivation practice requirement. c) As insect proof net and poly mulch is physically keeping away insect pests from the chilli fields, thus there is no necessity for intensive use of chemicals to control pests. d) Increased productivity can be achieved due to the use of hybrid MICHHY1 variety which perform well under drip irrigation and polymulching practice. A dried chilli yield of 3,000 kg /ac can be harvested using this technology compared to the 1,000 kg/ ac yield usually obtained under conventional cultivation system and variety. Thus, the use of technology reduce cost of production on one hand and increase the yield on the other thereby increased margins to the farmer in chilli cultivation. Simply, ultimate purpose of the overall project is to have sustainable income generation by the agricultural activities. Finally, products should have required value additions to be competitive at the market and proposed processing center will full fill the requirements in different ways. Currently, open drying of Chilli is taking place and required humidity levels are not possible to control by the farmers. Chilli drying machines will make sure the relevant qualities are met. Wastage of these types of crops are higher due to lack of acceptable storage conditions and providing proper storage facility is also can be considered as a key purpose of the project. Further, different value-added products will be directly expose to the market without any interfering of intermediate buyers.
Alternatives considered (*Different ways to meet the project need and achieve the project purpose*)	The “site alternative” would mean feasibility of meeting the project needs at the selected cluster. Chilli is an important cash crop to the farmers in Batticaloa district. There is potential to expand this further, as land and water resources are available in the district. Selected villages have well-established farmer organisations already and production of seasonal crops available immediately. There are experienced ground nuts, chili and vegetable farmers and all these upland cultivations rely on the technological support. Most of the farmers have large scale, low flat farmer-based lands with traditional cultivation practices. These farmers capable of cultivating chillie of their entire uplands, if they are getting

	technological guidance during the cultivation and also support on value additional services during the post harvesting processes. Further an attitude and market-led vision of field staff is highly acceptable. Hence, the selected area is highly supportive to meet the project needs within short period of time with the expected quality. The "technology alternative" would mean different technology applications to meet the project needs at the selected cluster. On farm technological applications will be introduced by ASMP with the dry chili cluster development plan. Hence, these technological improvements will result the consistent dry chili production to meet the project objectives. Farmer assets such as Hybid chilli seeds, Seedling trays, Drip tape Irrigation system, Insect proof net, GI pipes, and Polymulch film will be provided and society assets will be provided to complete the project. Further, a project is in pipe line to provide value additional services during the post harvesting processes. Hence, technological benefits will be there for the existing farmers. The "no-action" alternative would mean that no Dry chilli cluster project undertake by the ASMP and hence no irrigational support for the existing cultivators in the selected area. That will lead the same agricultural activities and economy of farmers won't increase. Therefore, conventional farm practices, low productivity, low quality and low income will continue to dominate the economy of the farmers and agriculture sector will not develop in selected villages.

PROJECT DESCRIPTION

Proposed start date	November 2021
Proposed completion date	June 2022
Estimated total cost	LKR 35 million
Present land ownership	Private Farmlands, Lands with deeds and permits
Description of the project (*With supporting material such as maps, drawings etc. attached as required*)	Agriculture Sector Modernization Project identified dried chilli also one of the market competitive and remunerative crops with potential for value addition. Chilli is one of the main spice ingredients in cooking. Thus it should be made available without shortage and price hikes. The country's annual dried chilli requirement of 60,000 mt is largely imported and supplied. Cost of annual import amounts to about Rs. 10 billion. Chili is one of the most important cash crops to farmers. However, farmers' chilli cultivation is mainly meant for green chilli production and

	dried chilli production is very much marginal. Thus self-reliance on dried chilli production is important for the country. The immediate objectives of the modernization are to increase productivity, decrease cost of production, improve value addition and provide steady market through buy back agreement. The ultimate goal is increased income and employment opportunity in production and value addition. Chilli production is very low in the drier months of May, June, July and again in the rainy days of November, December and January. During dry period production is affected due to extreme heat causing stress to the plant which in turn reduces the fruit set. Further, the presence of peak insect pest population during the months of May to July also makes the plants less productive. Flower drops is very high during rainy season and the wet conditions is more favourable for many fungal diseases leading to loss of production. The technology package of insect proof net and poly mulching along with drip irrigation technology system would overcome the losses caused by biotic and abiotic stresses especially during drier months. The hybrid chilli variety MICHHY1 introduced by Department of Agriculture is fairly resistant to the leaf curl complex disease which is the major cause for production loss and also other technical constraints encountered in chilli production. Further, it provides an enhanced yield of more than two to four times compared to other normal recommended chilli varieties. Thus, project will use this hybrid chilli variety for dried chilli production to enhance proactivity and reduce losses The new technology package for dried chilli production is more remunerative than the conventional dried chilli production. This will pave way for a chilli based agribusinesses to commercialize agriculture in Vavuniya district. However, this new technology package requires high initial cost and also a farmer group with entrepreneurship attitude. The project will assist to build up these physical and human capacities for the selected two farmer groups for an intensive chilli cultivation and marketing practices. Chilli is an important cash crop to the farmers in Vavuniya district. There is potential to expand this further, as land and water resources are available in the district. Project will select about 100 potential chilli cultivating farmers from seven villages who are fulfilling the selection criteria enabling the project for project intervention. Selected project locations are scattered in six villages namely Kaluthavali, Thetativu, Mankadu, Chddipalayam, Mahiloor and Kurukkalmadam. Manmunai Pattu (MP) - Arayampathy DS division has 27 GN divisions and project locations are distributed across two villages namely Kirankulam and Puthukudyruppu. Project will provide each selected farmer ½ ac technology package consisting of insect proof net, Drip Irrigation system,

	GI pipes to erect the insect proof net surrounding farmer field, polymulch, seedling trays for raising nursery plants and MICHHY1 variety hybrid chilli seeds for the farmers to commence cultivation in November, 2021. There are altogether about 100 leading farmers who will be selected with existing plantations in the most suitable locations with maximum exposure to a large number of farmers. The project is keenly looking to get on board at least 35% of female representation for the project. The selection of such farmers will be carried out with the participation of farmer organizations of the area, agriculture instructors, agriculture research and production assistant, agriculture scientist of PPMU, etc.

Project Management Team	A PMU was established under the Ministry of Agriculture to implement proposed project activities. **Project Director** Agriculture Sector Modernization Project Ministry of Agriculture No. 123/2 Pannipitiya Road, Battaramulla Tel: +94 112 877 550 Fax: +94 112 877 546 Email: projectdirectorasmp2@hotmail.com Web: https://www.asmp.lk/ Deputy Project Director – Eastern Province Agriculture Sector Modernization Project Ministry of Agriculture **Environmental and Social Safeguards Specialist** Agriculture Sector Modernization Project Ministry of Agriculture No. 123/2 Pannipitiya Road, Battaramulla Tel: +94 112 877 550 Fax: +94 112 877 546 Email: sanjayadms@hotmail.com Web: https://www.asmp.lk/ **Nature of Consultations and Inputs Received** Consultations with Environmental and Social Safeguard Specialist/ PMU • Great potential to increase farmers' income with less labour and inputs. • Ability to save water in the reservoir for the next cultivation season and minimize water crisis during Yala season. • Effective mechanism to attract young farmers for commercial agriculture. • Almost all the farmers cannot cultivate their entire farmland (3 acres) due to lack of water • Farmers are waiting up to the completion of the project to extend the cultivation in their entire.

DESCRIPTION OF THE EXISTING ENVIRONMENT

PHYSICAL FEATURES – ECOSYSTEM COMPONENTS	
Topography and terrain	The topography of the district varies from flat to undulating. The elevation of the District is not exceeding 8 meters in height above the sea level. It consists of undulating plains and alluvial flats watered by rivers from the mountains of uva and central province. Agro Ecological region represents the combinations of the characteristics of climate, soil and relief which basically determine the land use and management requirements of a given location. Batticaloa District is having one major agro-ecological region namely Low country Dry Zone (DL). DL region in the district is again sub divided into three sub regions. These Sub regions are DL2B, DL2 and DL4. 96% of the total land area of the Batticaloa district represent DL2B.
Soil (*type and quality*)	The dominant soil group (approximately 21% of the total extent of land) in the District is the Alluvial soil in flat terrain. The next dominant soil group is Reddish Brown earths, Non calcic Brown soils & Low Humic Glay soils; it occupies about 18% of the total land area. Rest of the area covers with several soil groups. They are Non Calcic Brown soil & Low Humic Glay soil in undulating terrain, Non Calcic Brown soil on old alluviam & solonetz in undulating terrain, Reddish Brown earths & Low Humic Glay soil in undulating terrain, Regosols on recent beach and dune sands in flat terrain, Solodized Solonetz and Solonchaks in flat terrain. There are some erosional remnants and Rock Knob Plains in the area. It covers 3% and 11% respectively. The physical and chemical properties of these soils are suitable for agriculture. However, the major constraint to crop production is the low available water rather than the limitations of the soils. Alluvial soil has the highest productivity with respect to other soils. It is present mostly along rivers and is carried by its streams during weathering of rocks. The soil is generally covered by tall grasses and forests, as well as a number of crops, such as rice and wheat. Alluvial soil is one of the best soils, requiring the least water due to its high porosity. The consistency of alluvial soil ranges from drift sand and rich, loamy soil to silt clays. Reddish-brown earth soil is a well-drained soil found on the crest, upper slope, and mid-slope physiographic positions within undulating and rolling landforms. Depth of soil varies according to the physiographic position of the landform. On hilly terrain, surface soil is eroded and quarts rich subsurface soil is present as a surface layer. The size of the quartz fraction and the amount depends on the location. The texture and structure of the sub-surface soil are gravelly sandy loam. Available soil moisture content is very low and therefore very susceptible to drought conditions. The soil is susceptible to soil erosion and should not be exposed. It has low organic matter content but is fair in available nutrient. Low Humic Gley soil is a deep and poorly drained soil found in flat terrain. The texture is sandy clay loam throughout the profile. CaCO3 depositions

	are present in the subsurface soil as concretions and it is a potential saline soil. Available soil moisture content is medium. It has low organic matter content and low available nutrient. Soil is used mainly for irrigated paddy. The dominant soil type of the Batticaloa district is Alluvial soils of variable drainage and texture; flat terrain and it is 21% of the total land area. Second highest soil type of the district is Reddish Brown earths, non-calcic Brown soils & Low Humic Glay soil in undulating terrain and it is around 18% from the total land area.
Surface water (*Sources, distance from the site, local uses and quality*)	Water bodies represent 5% of the total land area of the Batticaloa district and it contains around 4,145 ha of major tanks, 1,980 ha of minor tanks and 2,104 ha of natural ponds. MS&EP DS division has 28 tanks while 8 tanks are distributed across the Manmunai Pattu (MP) DS division. None of these two DS division has rivers or channels. There are no major perennial rivers that could be tapped to provide irrigation for cultivation. As there are no perennial rivers, seasonal rivers drain the rainfall water into the tank. Nevertheless, surface runoff water is stored in the irrigation tanks. However, there are certain environmental issues, particularly the inland salinity and major and minor irrigation tank pollution that need careful consideration in the district. Tanks, rivers or any other channels were not found in the selected project locations.
Ground water (*Sources, distance from the site, local uses and quality*)	In Batticaloa district deep confined aquifers of more than 60m deep have a relatively high recharge rate. The sedimentary limestone is highly faulted and it separates the aquifer into a series of isolated blocks, thus forming a number of separate groundwater basins. Based on field investigations, it is not possible to exactly quantify the availability, yield, and capacity within the project area. The groundwater table could be observed at 5-6m depth from the ground surface. The water table goes deeper during the dry season; however, it rises up during the rainy season. Groundwater is used for drinking purposes through dug wells, however, “hard water” is found in the project area. Agricultural wells are a common sight in the area which is used to extract groundwater to irrigate small areas of high-value crops or to provide a supplementary and secure source of water for the paddy crop. Closer to lagoons and the shoreline there is a possibility of contaminating groundwater by salts. Only the farmers already having perennial water source will be eligible to be a beneficiary of the proposed project. Proposed project beneficiaries are selected based on the availability of water and new extractions will not be allowed to be a part of the project.
Air quality (*Any pollution issues*)	Any major air pollution sources in the vicinity of the project site are not recorded. Small scale industries and traffic may cause air pollution within the area. However, https://www.breezometer.com/air-quality-map/air-quality/sri-lanka/Batticaloa shows that the Air Quality Index (AQI US) of Kirankulam is 35/500 and $PM_{2.5}$ is the dominant pollutant.

ECOLOGICAL FEATURES – ECOSYSTEM COMPONENTS	
Vegetation (*Trees, ground cover, aquatic vegetation*)	Major land uses and land cover in the District are forests, agriculture, home gardens and water bodies. Forest covers 41% of the total land area and the agricultural land covers 37% of the total land area in the District. The rest of the land covers by the home Garden 5%, water bodies 5%, wetlands 2% and Non Agricultural lands 5%. Other Land types such as Vacant Lands, Unproductive Lands, Sandy Area, Rockout crops etc. cover around 6% of the total land area. Agricultural activities include paddy cultivation and high lands are used for seasonal crops such as groundnuts, chili, long bean, and several cereal crops. Further, perennial crops such as Palmyra, coconut, Cashew are found within the selected area. addition, it was observed that many Adathoda and some native species such Kohomba, Murunga, etc.
Presence of wetlands	Batticaloa district has water bodies covering around 5% of the total land area. Annexure 4 shows the distribution of water bodies of the Batticaloa district. These water bodies include lagoons, major and minor tanks, natural ponds, and rivers and streams. There were no Wetlands observed within the selected project locations.
Fish and fish habitats	Livestock and Fishing play a supplementary role in the district's economic activities. Nearly 14,000 fishermen are found in the Batticaloa district. Manmunai Pttu DS division has around 700 fishermans and it is higher than the agricultural occupation in the DS division. Manmunai south & Eruvil Pattau DS division has around 800 fishing employees. Associated waterways were not identified as fish habitats around the selected areas.
Birds (*waterfowl, migratory birds, others*)	Water bodies/Wetlands, Coastal Natural Habitats associated vegetation, natural scrublands and abandoned paddy fields can be potential bird habitats including migratory birds. Many large birds such as owls, eagles and hawks hunt rodents.
Presence of special habitat areas (*special designations and identified sensitive zones*)	Some areas in the district are protected by gazette notifications. The protected area network includes Forest, Wild life reserves and corridors, other state forest lands, Grass Lands, Archeologically and Historically significant places, Areas of natural beauty and natural features of exceptional value; Water bodies/Wet lands, Coastal Natural Habitats and Urban Forests/Urban Parks. Batticaloa district has protected areas such as forest reserves, archaeological reserves, and coastal reserves. More than 99% of the protected area includes forest reserves and water bodies. Refer to Annexure 5 which shows the reserve forest of Batticaloa district. However, the selected project areas have not been identified as special habitat areas.
5.3 OTHER FEATURES	

Residential/Sensitive Areas (*E.g., Hospitals, Schools*)	Selected project locations are scattered in six villages namely Kaluthavali, Thetativu, Mankadu, Chddipalayam, Mahiloor and Kurukkalmadam. Manmunai Pattu (MP) - Arayampathy DS division has 27 GN divisions and project locations are distributed across two villages namely Kirankulam and Puthukudyruppu. Commonly, there are few Hindu temples are found across these villages. As per the selected random farmland, there is a Hindu temple call Vishnu Kovil around 200m away. Distances for the closest residential/sensitive locations are varying from the respective farmlands. The closest school is called Bt /Pd/ Mankadu Saraswathi Maha Vidyalayam and it's around 750m away from the selected farmland. Any of these will not have impact due to the project implementation activities.
Traditional, economic and cultural activities	Out of the 14 DS divisions of the Batticaloa district, only two DS divisions are selected have been selected for the implementation of the Agriculture Sector Modernization Project (ASMP). Manmunai South & Eruvil Pattu (MS&EP) Kaluwanchikudy DS division has 45 GN divisions and this selected project locations are scattered in six villages namely Kaluthavali, Thetativu, Mankadu, Chddipalayam, Mahiloor and Kurukkalmadam. Manmunai Pattu (MP) - Arayampathy DS division has 27 GN divisions and project locations are distributed across two villages namely Kirankulam and Puthukudyruppu. Six villages of Manmunai South & Eruvil Pattu (MS&EP) Kaluwanchikudy DS division represent farmlands from different GN Divisions. Total population of these selected GN divisions is 29,494. It represents 14,377 male and it is 49% of the total population. Female population of these selected GN divisions is 15,117 and it represent 51% of the total population. All are Sri Lankan Tamil and only 7 Buddhist were found in the selected GN divisions. 96% of the selected GN division is Hindu and 2% represent Roman catholic. Only around 57% of the population is between 20-60 age categories in the selected GN divisions of Manmunai South & Eruvil Pattu DS division. Nearly 12.0% of the population of the selected GN divisions is above 60 years of age and 31% of the population is below 20 years of age. The average family size in the GN division is 3.0. As per the age structure, nearly 67% of the population have registered as voters eligible for voting in the public elections. Accordingly, there are 3468 receiving Samurdhi in these GN divisions. Two villages from Manmunai Patty DS division were selected for the project and these farm lands are scattered across few GN divisions. Total population of these selected GN divisions is 10,706. It represents 5,279 male and it is 49% of the total population. Female population of these selected GN divisions is 5,437 and it represent 51% of the total population. 100% Sri Lankan Tamil ethnicity was found in the GN divisions. 72 Roman catholic, 122 other Christians are found while all others are Hindu. Only around 58% of the population is between 20-60 age categories in the selected GN divisions of Manmunai Pattu DS division. Nearly 10% of the

	population of the selected GN divisions is above 60 years of age and 33% of the population is below 20 years of age. The average family size in the GN division is 3.0. However, only 278 farmers are found in these selected GN divisions. Accordingly, there are 1,944receiving Samurdhi in these GN divisions.
Archaeological resources (*Recorded or potential to exist)*	Batticaloa district does not have considerable land extent having archaeological resources. Total archaeological reserved land area is around 18 ha and Manmunai Pattu South & Eruvil Pattu DS division does not have any identified archaeological resources. However, Manmunai Pattu DS division has around 1.2 ha of archaeological resources while highest land archaeological land area is covered by Koralai Pattu North DS division.

DESCRIPTION OF PROPOSED AGRICULTURAL ACTIVITIES

6.1 Cultivation	
Existing Condition of the Crop	The subproject concerns the introduction of new technology for the farmers who are practicing the traditional irrigation system for Chilli cultivation. The screening revealed that the existing watering system is a high-cost method and it increases water losses and wastes more time. The selected farmers will be encouraged to obtain high yield with more quality from their cultivations with improved irrigation system and it will be indirectly benefitted for customers too since they have the opportunity to buy high-quality fruit products at the local market. Presently, there are some farmers cultivating chili, and used land slots are low compared to the other crops. This is mainly due to the lack of water availability. Farmers were further discouraged due to low yield due to pests and diseases, moisture stress, shortage of availability of quality seeds, high inputs costs, the unstable market situation with the Government import policy. As a result, farmers withdrew themselves from the chili cultivation. Only uplands are used for Chilli cultivation and they will be provided the required water with the rehabilitation of lift irrigation system. The land area that is being used for chili cultivation in this area is an average of 1/2 acres. Marketing and all other activities related to Chili cultivation are at present attended by farmers individually with no collective bargaining for sales. The closest market for these selected farmers is Vavuniya and the Price fluctuation is the major issue faced by Farmers. At the present market price of 1 kg of dried chili is about 550 LKR. Furthermore, a short supply is direct to the retail market, mainly to the local boutiques. Chili cultivation has always been associated with inappropriate and indiscriminate use of pesticides and high labour input for weed control, both of which have significantly contributed to increasing the cost of

	cultivation. The continuous and indiscriminate use of pesticides has major drawbacks such as adverse effects on human beings and other non-target organisms, development of pest resistance, the outbreak of secondary pests, and environmental pollution. However, agrochemicals have not shown successful results for controlling the leaf curl complex. At present farmers prefer to produce green chili than dry red chili due to high price, ready market, high return, lack of availability of drying facilities, high labour input for drying, etc. For dry chili, production harvesting should be done at the proper stage more than 80% red coloured pods, and the use of tarpaulins when dryers are not available. This sub-project encourages Chilli crop production in the dry zone of Sri Lanka. The introduction of a drip irrigation system will save water and it will be beneficial to conserve the groundwater table of the area. Further, the current watering system (Irrigation) encourages spreading diseases since the irrigated water flows over the total cultivation land.
Polluting Processes (point source)	
In cultivation some key polluting steps, although limited, takes place; mainly in the cultivating and post harvesting phases.	
Land preparation for cultivation	In general, farmers prepare nursery beds width of almost 0.9m (3ft) in well-drained virgin soil. Farmers sterilized soils before sowing by burning the nursery bed with rice husk and rice straw. At present some farmers use seed treatment with fungicides recommended by the DOA or chemical companies. Usually, nursery beds are prepared few days before seeding. Application of compost or any other organic manure is a common practice. In addition, the application of recommended fungicide for control of damping-off and anthracnose is also practice. After seeding seeds are covered with a layer of soil and straw. Thereafter, remove the mulch 7-10 days after sowing before the seedlings overgrow through the mulch. To avoid hot sunlight and heavy rain cover the bed with Cajon leaves or transparent polythene. Then almost one week before transplanting control water application. When the seedlings are ready for transplanting planting will be done with the onset of rain. Land preparation is done by using agricultural machineries such as ploughing or disking for the cultivation of OFCs and vegetables. In general, raised beds are prepared width of 0.9 m (3ft) to facilitate proper drainage due to high clay in paddy soils. Some farmers make farrows without making beds. The majority of farmers make planting holes approximately with the spacing of 50x50cm or 60cm x50cm. In general, compost and chili chemical fertilizer mixture are applied in the hole.
Water requirement[1]	Water is applied immediately after transplanting. After planting, they apply different chemical fertilizers every 3-4 weeks. Though flood

[1] https://doa.gov.lk/FCRDI/index.php/en/crop/42-green chili-e

	irrigation is popular among farmers it has created many problems due to poor drainage of soils found in the area. Excess water use due to flood irrigation could be considered as the main reason for the increase of diseases and subsequent low yield. New low-pressure drip and mini-sprinkler irrigation systems that conserve water and prevent laminar erosion; precise application of fertilizers using the low-pressure irrigation systems and based on soil and foliar analyses.
Use of fertilizer and pesticides and weedicides	Farmers use chemical fertilizer for Chilli cultivation. Urea is used as the nitrogen source, Rock Phosphate and Triple Super Phosphate are used as the phosphate source and Mutreate of Potash is the Potassium source. However, proposed project will not provide chemical fertilizers, and also not encouraged to do so. Further, the chemical fertilizer to cultivate 0.5 acer slot will be low and farmers will be used their own space to store if required. Leaf Curl Complex (LCC) was identified in the 1980s is considered a major threat for chilli cultivation particularly in the dry zone of Sri Lanka. Chilli leaf curl complex is prominent especially in Yala season than in Maha season. Therefore, the objective of the chilli hybridization and selection programme of the DOA targeted to develop new chilli varieties with tolerance/resistance to leaf curl complex (LCC), Choanephora blight (Choanephora spp.), Anthracnose (Colletotrichum capsica), Leaf spot (Cercospora capsica) etc. In addition, insect pests are also major constraints to the production of chilli in Sri Lanka. It reduces not only the production but also the quality of pods. Important pests reported in chilli are Trips (Scirtothrips dorsalis), Mites (Hemitarsonemous latus), Aphids (Aphis gossypii, Myzus persicae), White fly (Bemisia tabaci), and Pod borer (Spodopetera litura / Helicoverpa armigera) etc. Chilli leaf curl complex identified as due to damage by thrips (Scirtothrips dorsalis), mites (Hemitarsonemous latus) and aphids (Aphis gossypii, Myzus persicae) and viruses transmitted by white fly (Bemisia tabaci). Therefore, farmers apply various agrochemicals available in the market. Chilli cultivation has always been associated with inappropriate and indiscriminate use of pesticides and high labour input for weed control, both of which have significantly contributed to increasing the cost of cultivation. The continuous and indiscriminate use of pesticides has major drawbacks such as adverse effects on human beings and other non-target organisms, development of pest resistance, the outbreak of secondary pests and environmental pollution. The project proposed by the DOA is a selection of quality seeds, use appropriate nursery management techniques, early planting, use of barrier crops, use of recommended fertilizer, use of sticky traps, use of mulches, spraying of water, control weeds, adequate irrigation and use of insect-proof net.
Harvesting	At present farmers prefer to produce green chilli than dry red chilli due to high price, ready market, high return, lack of availability of drying facilities, high labour input for drying etc. For dry chilli, production harvesting

	should be done at the proper stage of more than 80% red coloured pods and the use of tarpaulins when dryers are not available.
Post-harvest storage and transportation	This Chili is mainly used as dry chili and a quality drying process is important. Therefore, the harvest should be transported to the processing centre after harvesting. Grading, drying, and packing of the dried chili is an essential part during the post-harvest period as it helps to cut down the losses and increase the high quality and value. Therefore grading, drying, packing, and transporting should be undertaken with improved technology. These technology facilities will be available for farmers.
Other factors	
Solid waste	The solid organic waste is generated as crop residuals and at the post-harvest period. All the crop residuals and post-harvest waste should be burnt or buried under the soil to keep the hygienic condition of the farmlands.
Wastewater	Due to the application of an integrated pest management mechanism, soil and ground/surface water pollution will be minimalized. ASMP will conduct awareness creation and training programs for both farmers as well as the officers regarding integrated pest management as per the Pest Management Plan (PMP). Application of IPM during each stage given below:

APPLICATION OF AN INTEGRATED PEST MANAGEMENT PRACTICES FOR DRY CHILLI CLUSTER

S.No	Crop stages	IPM Practice/ practices	Impacts of IPM Practices	Benefits
1	Pre-Land preparation stage	Proper removal of debris, residues and host plants (Buring, dumping, compost making) - Keep land clean. Deep ploughing during dry seasons Field sanitation by burning straw or paddy husk or spreading transparent polythene cover	Less incidents of Pest, diseases and weeds, Improvements in aeration in the soils	Farmers maintain pest and disease-free fields
2	Land preparation stage	Deep ploughing and making soils in to fine tilth using rotavator. Removal of weeds and their residual parts (tubers and rhizomes etc.) Sun drying, adding cow dung and compost	Destructions of pests (eggs and cocoon and adult) Control weeds growth Good drainage	Low incident of pest attack Low water stagnation leads to healthy plants and low virus wilt diseases
3	Planting stage	Growing resistance variety, using disease free seeds, seed treatments and carrying out good nursery management (Sanitation of nursery by burning of paddy husk and straw). Removal of unhealthy plants	Healthy plants	Low incidents of pest and disease attack
4	Seedling stage/ Planting stage	Using appropriate spacing and timely planting (Collective planting by all farmers at a particular time frame in early in the season)	Pest and disease-free fields	Low incidents of pest and disease attack

		Boarder planting (selecting insect-repelling plants)		
5	Juvenile stage	Identifying pest, disease – Proper Removal of unhealthy plants. Controlled watering by using sprinkler system Using insect protective net or clothes Proper manual weeding	Pest and disease-free fields Weeds free fields	Low incidents of pest and disease attack
6	Flowering stage	Identifying pest, disease – Proper Removal of unhealthy plants. Removal of larva (hand collection) Controlled watering by using sprinkler system	Pest and disease-free fields Weeds free fields	Low incidents of pest and disease attack
7	Maturity stage	Identifying pest, disease – Proper Removal of unhealthy plants. Removal of larva (hand collection) Controlled watering by using sprinkler system	Pest and disease-free fields Weeds free fields	Low incidents of pest and disease attack
9	Harvesting stage	Removal of infected / effected chili pod Controlled watering by using sprinkler system	Pest and disease-free fields No pest and diseases spreading	Low incidents of pest and disease attack
10	Post Harvesting stage	No post-harvest	----------	----------
11	Storage stage	No storage	----------	----------

12	Transport stage	Proper packing in hygienic gunny bags and transport	No pest and diseases spreading	Low incidents of pest and disease attack
13	Marketing stage	No	No	No
14	Any others	Inorganic fertilizer and chemical are used when there is necessity only	Pest and disease-free fields	Low incidents of pest and disease attack

PUBLIC CONSULTATION

The consultation was held with the support of the project director, project engineer, and agricultural scientist of the Northern Province and the project coordinator of the selected DS division. Overall project implementation and future plan were discussed with them and deep level information was collected. They were trying hard to rehabilitate and distribute water as soon as possible to the beneficiaries.

Farmer gatherings were not conducted due to the pandemic situation. However, on-field discussions were conducted with benefitted farmers while ensuring COVID 19 safety precautions. The conclusion of the consultation was clear, and it was to rehabilitate the pump house and provide water immediately starting from next season onwards. Further, the following comments were taken during the discussions held with farmers in the selected area.

- **Water availability and accessibility**

All above-selected farmlands are uplands and none of them are fed by surface water resources. Currently, farmers are getting water from open well/agro well and deep tube wells. However, the proposed piolet project is looking farmers who is having minimum of 0.5 acer cultivable lands with enough water for the proposed cultivation. Only the farmers already having perennial water source will be eligible to be a beneficiary of the proposed project. Proposed project beneficiaries are selected based on the availability of water and new extractions will not be allowed to be a part of the project.

- **Other ASMP projects**

Beneficiaries are well aware that they will be funded for a separate post harvesting processing center. Further, the Dry chili processing centre is one of their keen hope to produce high-quality dried chili. Some beneficiaries already cultivating Chili up to 0.25-0.5 acres along with the other crops. They are very keen to expand the chili cultivation based on the result of this project and willing to take technical support towards the high yield. Market accessibility was highlighted during the discussion and it was mentioned that the closest market is Arayampathy. Arayampathy market price per 1Kg of dry chili is around 500 LKR and farmers looking to have a higher and stable prices in the future.

- **Current water usage**

All most all beneficiaries have their own open wells/agro wells or tube wells for the cultivation and maximum utilization ensure 1-1.5 acres of different crops. They cultivate two seasons per year using these resources and maximum land usage is limited to 1-1.5 acres. The water level is 6-7 m below the ground level and it goes deeper with the dry season.

- **Issues bound with flood irrigation system**

Excessive flood irrigation creates many problems such as waterlogged conditions, poor crop performances, high disease incidence and waste of water, high soil erosion due to prolonged flood irrigation were identified in underwater conservation and management discussions. Bringing water to inaccessible lands was a prioritized question raised by farmers and the

introduction of water-conserving and low-pressure drip and the mini sprinkler systems was highlighted during the discussion. However, technical knowledge on implementation and continuity of mini sprinkler systems needed to be given.

- **Failure on export market**

One of the main objectives of the project is to full fill the local market-based production and doubt were highlighted that what will happen if local market demand is lower than the supply. Consequently, it should be searched that are there any options available in the local market for excessive production?

- **Infrastructure development**

Some farmers looking to bring water to lands that are not flooded by the existing irrigation systems. Hence water and drainage work are required to bring water to farms and to avoid flooding and waterlogging. Further construction of post-harvesting processing centre was highlighted during the discussions.

Further, there were points highlighted during the discussions such as the use of weedicide, poor and inefficient land utilization pattern, attention for micronutrient fertilizers, and knowledge of farmers for pest management mechanisms for better crop production. There is a high tendency of using organic fertilizers and most of them are producing compost on their own. Further, livestock farming is found at each beneficiary.

The majority of the community is willing to support the project activities as they will benefit from the proposed sub-project directly. Extensive social screening has been covered under the Social Safeguard component.

Figure 1: Existing lands for Chili cultivation

Figure 2: Photographs of community consultant

Figure 3: Onsite discussions with farmers

- **Existing environmental issues**

Some farmers have raised their existing issues related to the agricultural activities during the public consultation such as water scarcity and accessibility difficulties. Unavailability of enough water is a major issue and they are extracting groundwater using agro wells and tube wells. Further, it is 6-7 m deeper from the ground level.

Individual community consultation feedbacks are given below.

Name	Details	Matter Discussed/Suggestions
Vaiyamuththu Shashikumar	is a 47 years old farmer having six family members including himself. He is a leader of one of the farmer organisations and he has 1 acer deed land.	Only a part of the land is cultivated twice a year using tube well water. The current water level of the open well is around 20 feet below the ground level. However, he is managing cultivation activities using tube well water and mainly seasonal crops are cultivated such as Pathola, Long bean and Chilli. He sells crops in to the Arayampathy market and current price of green chilli is around 150 LKR. He is waiting to get the technological support to extend chilli cultivation up to entire

		land and he hopes to manage water with the introduction of drip irrigation system.
Shivaneshthura Shivarasha	he is a 46 years old farmer with five family members. He also has 1 acer deed highland and it is the land proposed for the chilli cultivation.	Chilli and Brinjal is the main crop he is cultivating using a tube well. However, he sends the crops to the Kalmunai market which is bigger than the Arayampathy market. Currently, seasonal crops are cultivated based on the water availability of the tube well. As per his experience, it is enough to cultivate two seasons marginally.
A. Kularathanam	Kularathanam is a 50 years old farmer having four family members. He was representing Puthukudiiruppu South and he has 2 acers of Cashew cultivation.	Two acer highlands is used for Cashew and 1 acer land is currently used for seasonal crop cultivation. Tube well water is used for the cultivation and he already has one acer of Chilli cultivation. His ambition is to get the technical support from the project for 0.5 acer cultivation package and to extend up to his entire land.
K.Satheesilam	He is 54 years old farmer having 1 acer rent land. He has four family members including himself.	Chilli and Brinjal is the main crop he is cultivating using a tube well. He sends his crop to the Arayampathy market and he is not satisfying with the current market price of dry chilli.
T. Nadeshalingam	is a 50 years old farmer in a 3 member family. He has 1.5 acer deed high land for seasonal cultivation.	Entire 1.5 acer of high land is used for seasonal crops and he claims that he is extracting enough water from the tube well for his entire cultivation. He is already having 1 acer chilli cultivation. He is very keen on the benefits which are derived from the Chilli collection and processing center.
N. Kannasundaram	He is a 51 years old farmer from Mankadu. He has four family members and 1 acer permit land is used for the cultivation	Main crop is green chilli and lady fingers are cultivated to full fill the remaining part of the land. He also uses water from tube well. His closest market is Kalmunai and he does not satisfy the price of Hybrid chilli. He expects to have stable high price for the chilli through the collective approach from the proposed processing center.
K.Nagalingam	She is 48 years old farmer having 3 family members.	She has 1 acer deed high land and water is used from tube well for the cultivation. Mainly chilli and lady finger are cultivated

		using flood irrigation. She is interested on the drip irrigation technology and issues related to the pesticides were discussed.
M. Nawanaththana Raja (38 Years old female farmer)	All these farmers are having 1 acer deed high land and all of them are using tube well water for their cultivation	Lady fingers are more common among these farmers and few other seasonal crops are available. Existing wild animal threats were highlighted. It was identified that the crop damages are mainly due to Rabits and Monkeys.
S. Kopalasingham (48 Years old farmer)		
S. Suntharalingam (40 Years old farmer)		
P. Pakeelatharan (44 years old farmer)		
M. Rajendram (39 years old farmer)		

ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

SCREENING FOR POTENTIAL ENVIRONMENTAL IMPACTS

	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
1	Will construction and operation of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in water bodies, etc?)	√		1) Low-moderate	The existing land preparation and flood irrigation system will be changed. Land preparation techniques will focus on reducing the effects of flood irrigation. No significant disturbances for any existing land use or waterbodies and no negative impact causes are anticipated.
2	Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?	√		Moderate	Pesticides, weedicides, fertilizers, and some additional chemicals will be used and there is a possibility to have chronic impacts due to the long-term usage. However, proposed techniques will reduce the number of chemicals and fertilizers use and modern techniques/methods will be introduced to increase productivity by other means.
3	Will the Project produce solid wastes during construction or operation?	√		Low	Lands clearing and preparation stage there can be an insignificant solid waste generation. During the operation, solid organic waste will be produced as crop residuals.

	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
4	Will the Project release pollutants or any hazardous, toxic or noxious substances to air?		√	Moderate - high	Pesticides, weedicides will be used and released into the air. Possibility to have significant impacts on other flora & fauna.
5	Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?	√		Low	There will be an insignificant noise generation from machinery during land preparation and crops transportation.
6	Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater or coastal wasters?	√		Moderate	All chemicals used, including pesticides and weedicides during cultivation, may contaminate land or water. It will have an impact on the surface and groundwater in surrounding areas if not properly managed.
7	Will the project cause localized flooding and poor drainage during construction Is the project area located in a flooding location?		√		The project will not cause localized flooding
8	Will there be any risks and vulnerabilities to public safety due to physical hazards during construction or operation of the Project?		√		No severe health and safety hazard was identified. Better hazard identification and prevention and corrective measures during operation will eliminate the risk associate.

	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
9	Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected by the project?		√	Low	Chilli transportation from cultivated lands to post-harvesting storages and transportation from post-harvesting storages to shipments/or any other location will be taken place. No creation of significant environmental problems.
10	Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?		√	**N/A**	
11	Are there any areas or features of high landscape or scenic value on or around the location which could be affected by the project?		√		No areas or features with high landscape or scenic value on or around the location.
12	Are there any other areas on or around the location which are important or sensitive for reasons of their ecology e.g. wetlands, watercourses or other water bodies, the coastal zone, mountains, forests which could be affected by the project?	√		**Low**	No important or sensitive areas on the project location are affected by the project.
13	Are there any areas on or around the location which are used by protected,		√		

	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
	important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, migration, which could be affected by the project?				
14	Is the project located in a previously undeveloped area where there will be loss of green field land		√		No such green fields are encountered.
15	Will the project cause the removal of trees in the locality?		√		No removal of trees is required during PVC laying as the existing width of the road and canal will not be changed.
16	Are there any areas or features of historic or cultural importance on or around the location which could be affected by the project?		√		No features of historical importance identified
17	Are there existing land uses on or around the location e.g. home gardens, other private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining or quarrying which could be affected by the project?		√	**N/A**	
18	Are there any areas on or around the location which are densely populated or		√		No densely populated or built-up areas are affected by the project.

	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
	built-up, which could be affected by the project?				
19	Are there any areas on or around the location which are occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities, which could be affected by the project		√		No sensitive land-uses in the vicinity are affected by the project.
20	Are there any areas on or around the location which contain important, high quality or scarce resources e.g. groundwater, surface waters, forestry, agriculture, fisheries, tourism, minerals, which could be affected by the project?		√		
21	Are there any areas on or around the location which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?		√		No location where any environmental standards exceeded or have environmentally polluted.

ENVIRONMENTAL MANAGEMENT PLAN

Contractor's responsibility for mitigating adverse environmental issues raised during agricultural activities

№	**Potential Environmental Impacts and Risk Level**	**Key project activities causing the impact**	**Mitigation Measures proposed and action to be implemented by the Contractor**
1	Public complaints and lack of community support for the project implementation	• Information Disclosure among Stakeholders • Community Outreach activities including training	• Discussions should be conducted with the beneficiary farmers including women, and youth • The beneficiary farmers selection based on the criteria which were developed at stakeholders meeting and identifying of beneficiary farmers were undertaken transparently • Residents in the area will be briefed on the project, purpose and design, and outcomes with a comprehensive discussion • Communication and training activities focusing on women, youth, and farmers who are poor in communication • The contractor should take note of all impacts, especially temporary issues and safety hazards that will be of concern to the cropping pattern of the farmers. All possible impacts will be mitigated as stipulated in the EMP to mitigate them • The contractor will maintain a log of any grievances/complaints and actions taken to resolve them • A copy of the EMP should be available at all times at the project supervision office on site
2	Spreading COVID 19 virus	• All activities	• The contractor must ensure that all workers, including managers, are well trained on COVID 19 safety precautions published by the health ministry.
3	Lack of knowledge on basic harvest and post-harvest practices lead to low quality	• Mechanical scarring and bruising quality defects • Cleaning the selected product	• Maintain good hygiene and good housekeeping • Practical training for the selected farmers on basic harvest and post-harvest practices to protect the quality of the Maintain good hygiene and good housekeeping

№	**Potential Environmental Impacts and Risk Level**	**Key project activities causing the impact**	**Mitigation Measures proposed and action to be implemented by the Contractor**
	of product and high amount of waste	• Storing the harvested product before delivery to the drying facility • Discarding poor quality Chili and other waste organic materials in the field	• Practical training for the selected farmers on basic harvest and post-harvest practices to protect the quality of the product and to assure the packing facility receives only clean and viable product • Avoiding mechanical scarring and bruising quality defects • Provide packaging materials and storage facilities
4	Activities related to installation of drip irrigation systems	• Installation of drip irrigation systems • Fixing water pumps and electricity supply • Plumbing works	• Carry out installation works during off cultivation seasons • Solid waste generation during installation should be minimized and disposed generated waste with care • Potential damages to pipe system should be minimized by burying or covering the pipe distribution
5	Spreading of Invasive Alien Species	• Vegetation clearing • Cultivation of Chili	• Provide DOA certified Chilli variety only to farmers • Good housekeeping • Manual and integrated weed control • Prevent weed spreading via organic manure (Compost) by periodic inspection and manual removal after application
6	Noise Pollution & Vibration that can affect nearby structures	• Use of tractors and agricultural equipment/ machineries • Transportation of products from farmlands to post harvesting storages	• Working time for noise/vibration generation activities should be restricted and carried out only from 6 am to 6 pm. • Noise related to all agricultural improvement activities should not exceed 55 dB (daytime) and 45dB (night time) as practicable as possible. • Equipment and machinery should be maintained in good condition. • It is highly recommended to do transportation during daytime only

№	**Potential Environmental Impacts and Risk Level**	**Key project activities causing the impact**	**Mitigation Measures proposed and action to be implemented by the Contractor**
7	Contamination of water, land and air during usage of chemicals (pesticides, weedicides.)	• Land preparation • Vegetation clearing • Use of fertilisers • Use of chemicals for specific requirements	• Introduce technological methods to reduce dosage amounts • Awareness of usage time, handling, and storage • Guidance on a suitable time for the usage of chemicals • Promote organic fertilizers • Formulation of fertilizer regimes based on complete soil tests and foliar analysis
8	Water Quality	• Cultivation of Chilli	• Excess water extraction is to be cut down to preserve the ground water table • Proper introduction of drip irrigation practices instead of flood irrigation to preserve water and use of modern techniques to reduce water consumption • Proper irrigation practice to avoid excess water drain back to the RB canal
9	Solid Waste Disposal	• Organic materials in the field • Waste from weed control activities	• Burnt to maintain the farmlands' hygienic condition • Use post-harvest waste for compost production
10	Spread of crop related diseases among other flora species	• Throughout the cultivation period	• Provide technical guidance on the application of chemicals including dosage, suitable time, and frequency • Pest population and pest damage surveys to assess pest threshold status for application of pesticides
11	Health hazard	• Use of agrochemicals (fertilizers, pesticides, weedicides etc.)	• Carry out proper hazardous identification and risk assessment of all proposed activities • Training and awareness on safe chemical handling • Implement proper health and safety protocols by elimination, substitution, engineering controls, administrative control, and provide personal protection equipment (PPEs). Provided

№	**Potential Environmental Impacts and Risk Level**	**Key project activities causing the impact**	**Mitigation Measures proposed and action to be implemented by the Contractor**
			necessary PPEs (basic should include gloves, goggles, masks, and protective clothing) • A safety inspection checklist should be prepared to take into consideration what the workers are supposed to be wearing and monitored • Pest and disease control according to the international standard and pest management action plan prepared by ASMP • Formulation of fertilizer regimes based on complete soil tests and foliar analysis • Pest population and pest damage surveys to assess pest threshold status for application of pesticides
12	Temporary loss of livelihood due to inability to grow crops during Installation works	• Installation of dripirrigation systems	• Implement project activities during the off-season of upland cultivation. • Carry out sub-project activities to a strict timetable to prevent excessive losses to the farmers

COST OF MITIGATION

№	**Environmental mitigation measure**	**Cost (LKR)**	**Remarks**
1	Information Boards, leaflets	60,000	Awareness leaflets for organic cultivation practices and pest management
5	Waste removal from site	40,000	Waste from vegetation clearing, site preparation, labour camps

6	Training of Farmers and Village level stakeholders on new technological applications	200,000	Should be scheduled to a few sessions

CONCLUSION AND SCREENING DECISION

Summary of environmental effects:

Assuming that all mitigation measures are implemented as proposed, the following effects can be predicted

Key project activities	**Potential Environmental Effects**	**Significance of environmental effect with mitigation in place2**
DURING AGRICULTURAL ACTIVITIES		
➢ Land preparation • Fencing (if applicable) • Land preparation • Micro levelling • Drainage Labour • Raised Beds • Preparation of pits & planting • Planting materials • Fertiliser in the planting pit • Planting Tools	Solid waste generation	NS
➢ Introduction of basic flood prevention and drainage field techniques • Quick water evacuation ditches	Less water consumption, less soil erosion	SP

[2] NS - Effect not significant, or can be rendered insignificant with mitigation, SP - Significant positive effect, SN - Significant negative effect, U - Outcome unknown or cannot be predicted, even with mitigation

Key project activities	**Potential Environmental Effects**	**Significance of environmental effect with mitigation in place2**
• Surface drainage techniques (removal of wet spots)		
➢ Use of fertilisers and chemicals • Application of fertilizers • Application of weedicides • Application of pesticides • Other Spray	Land, water an air contamination	NS
➢ Manual weed control	Solid waste generation	NS
➢ New and improved quality enhancing technologies • Introduction of water conserving and drip irrigation systems • Insect proof net • Polythene mulch	• No such harm, less use of water and Less contamination of agro-chemicals on Land, air and water • Less insect impact	SP

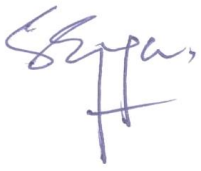
EMP IMPLEMENTATION RESPONSIBILITIES AND COSTS

The overall responsibility of ensuring compliance with safeguard requirements rests with the PMU while the contractor will be responsible for implementing the provisions of the EMP. In addition, the PMU will be directly responsible for reviewing the proposed design to ensure that all design-related mitigation measures mentioned herein are implemented. The overall supervision will be carried out by the in-house staff of the PMU supported by the Provincial Project Agro Specialist, who is responsible for the overall design and supervision of the proposed project. Any consequent design modification will be reflected in the project cost.
Environmental & Social monitoring will be carried out largely through visual observations and compliance monitoring using the checklist provided in the EMF & RPF by the Provincial Project Agriculture Specialist of the PMU and the contractor jointly. The Environmental and Social Safeguards Specialist will need to visit the site quarterly and report on issues and performance on ESMP implementation to the PMU.

SCREENING DECISION RECOMMENDATION

This project does not require environmental clearance under national environmental regulations. No other approval is required due to the spread and magnitude of the project. The project will have negligible environmental impacts, mostly limited to the cultivation period. The impacts on the physical and biological environment are virtually none. The majority of the potential adverse effects can be classified as general agricultural-related impacts and can be mitigated on-site with Good Agricultural Practices. These potential impacts are temporary in nature. It is recommended to start the project work in the off-season for paddy cultivation and avoid night-time work. Implementation of the Environmental Management Plan is sufficient to mitigate the identified impacts.

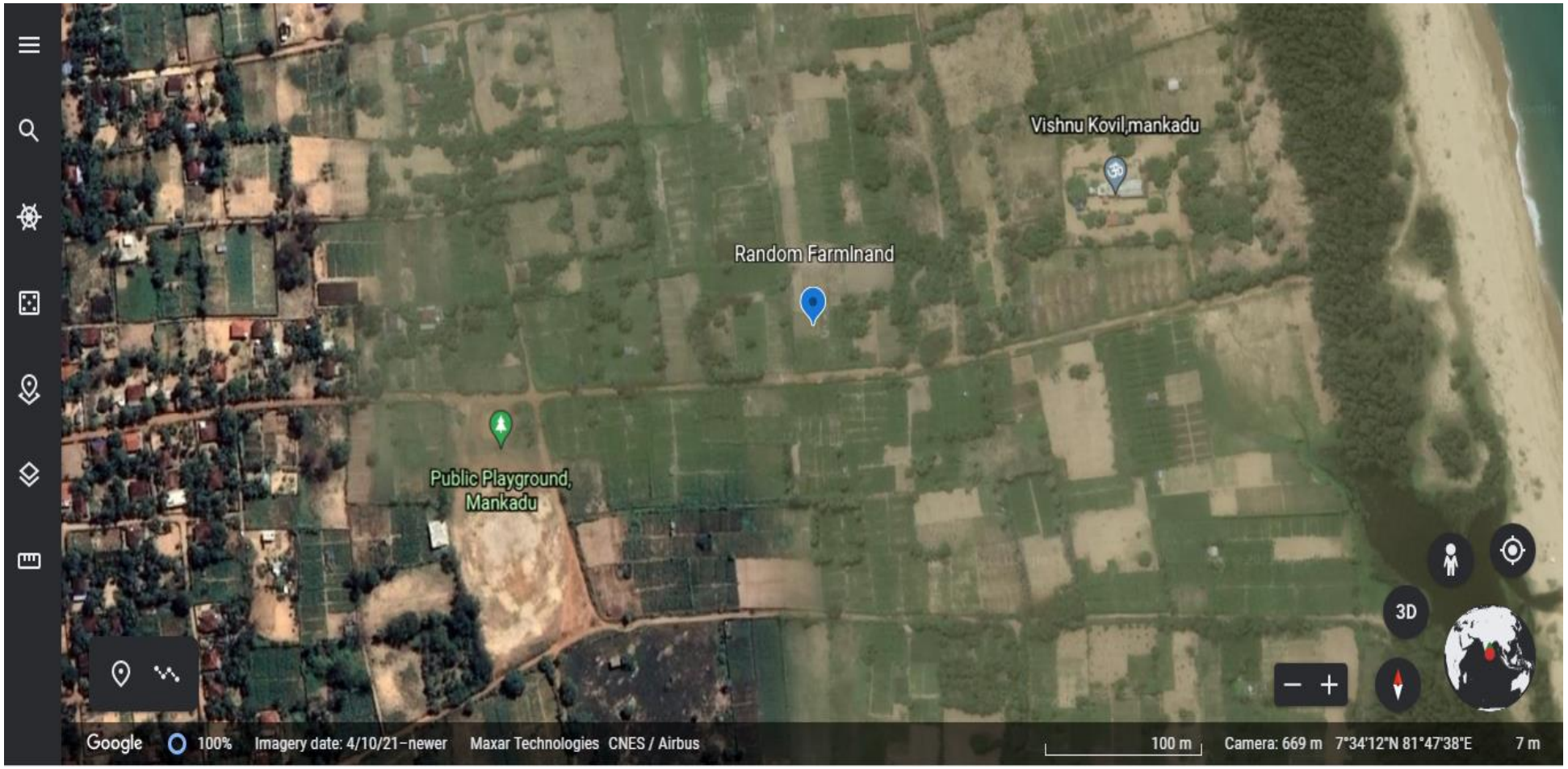
DETAILS OF PERSONS RESPONSIBLE FOR THE ENVIRONMENTAL SCREENING

Screening conducted and reviewed by **D.M. Sanjaya Bandara** **Environment and Social Safeguard Specialist** **Agriculture Sector Modernization Project** **Name/Designation/Contact information**	**Date** **December 2021**  **Signature**
Screening report recommended by **Dr. Rohan Wijekoon** **Project Director** **Agriculture Sector Modernization Project** **Name/Designation/Contact information**	**Date** **December 2021**  **Signature**

Annexure 1: List of References

1) https://luppd.gov.lk/images/content_image/downloads/pdf/llrc_batticaloa.pdf

Annexure 2: Project location maps




Proposed Land Areas for Dry Chilli Cluster in Batticaloa
Write a description for your map.
Legend
Access Road to Dry Cluster Lands
Farmer Visited
Public Playground, Mankadu
Samurdhi Bank Mankadu
Vishnu Kovil,mankadu
Luxmy Food City
Mankadu
Vishnu Kovil,mankadu
1st Farmer Visited
2nd Farmer Visited
Victoria Studio & Newspaper Agent
Public Playground, Mankadu
Himy Life
Meeting with Farmers, Dry Chilli Cluster, Mankadu
Samurdhi Bank Mankadu
Sk Motors
Google Earth
Image © 2021 Maxar Technologies
600 ft
N

Annexure 3: Beneficiaries list

S.N	Beneficiaries Name	Address	NIC No	Contact No	G.N Division
01	Nagalinkam yogarasa	Kirankulam – 06- North	71269.3584V	0774164558	
02	Vairamuthu Sasikumar	Beach Rd, Kirankulam-North	751582862V	0775918202	
03	Ponnampalam Thevarajah	Aalaiyadi Rd, Kiranulam - Central	196704603591	0758550065	
04	Amarasinkam Varnakulasingam	Visnukovil Rd, Kirankulam - Central	711610286V	0779060683	
05	Ravindran Sasikaran	Visnukovil Rd, Kirankulam - North	832604593V	0758251033	
06	Poopalapillai Sivanantharasa	Main Rd, Kirankulam - South	62694180V	0754258767	
07	Selvarethinam Thavaroopan	Music college Rd,Navatudah(kirankulam North)	791412269V	0769498545	
08	Sivalinkam Nirmalathevi	Beach Rd,Kirankulam - Central	608463496V	0767029111	
09	Kanakasabapathi Thanapalasingam	Kanthaiyah Rd, Kirankulam	850151377V	0752006580	
10	Samithampy Mahathevi	Palaiya thapalaka Rd,Kirankulam – central	635122838V	0778685668	
11	Selvanayagam Nadesalinkam	Panaiyadipalla Rd, Kirankulam -06	701880501V	0771019293	
12	Allimuthu Vijayan	Sellathampy Rd,Kirankulam – North	750050069V	0757952209	
13	Sivanesathurai Sivarasa	Main Rd,Kirankulam-06	740281283V	0757598100	
14	Kirusalini Gowravan	Nesavunilaiya Rd,Kirankulam	907391108V	0752824808	
15	Samithampy Thavarasa	Nesavunilaiya Rd,Kirankulam	590144096V	0756000770	
16	Thampirasa Kanthalingam	Tharmapuram,Kirankulam	520084940V	0773941011	

17	Ponnampalam Santhirasekaram	Kirankulam – North	710233373V	0758780557	Kirankulam-North
18	Konamalai Nanthakopal	Sellathampy Rd, Kirankulam	700072029V	0754082306	Puthukudiyirppu-South
19	Samithampy Paramalinkam	Cheddipalayam - South	543173592V	0777308680	Puthukudiyirppu-North
20	Manikkam Thayakaran	9th kaddai Rd,Kirankulam -North	692460812V	0755630275	Puthukudiyirppu-South
21	Thavarajah Rakasuthan	Beach Rd ,Kaluthavalai - 04	921253303V	0752922590	Puthukudiyirppu-South
22	Kanthappodi Sathiyananthan		681132694V	0763136604	Puthukudiyiruppu-North
23	Sithamparapillai Vijayenthiny	Kanthakuddy Rd, Kirankulam-South	706320156V	0752879873	Puthukudiyirppu-South
24	Mahendran Seethevipillai	9th kaddai ,Kirankulam – North	677852666V	0750752212	Puthukudiyirppu-South
25	Selvarasa Ramesh	Mariyamman Rd,Kirankulam	197921303657	0755133243	Puthukudiyirppu-South
26	Somasuntharam Jeyasuntharam	Kumaran kalamanra Rd, Kaluwanchikudy	751250754V	0757007106	Puthukudiyirppu-South
27	Kanthappan Susanthan	Main Rd, Kaluthavalai-01	872851771V	0757021292	Puthukudiyirppu-South
28	Kaneshan Thevathasan	Sellathampy Rd, Kirankulam North	821121809V	0752456592	Puthukudiyirppu-South
29	Arunasalam Kunarednam		710015155V	0773132763	Puthukudiyirppu-South
30	Parasuraman Thanuraj	Visnukovil Rd,Kirankulam-06	911583321V	0756207842	Puthukudiyirppu-South
31	Senathipathi Arudsevam	Amalapuram	760753947V	0779684018	Puthukudiyirppu-South

Details of Dry Chilli Production Program-Beneficiaries

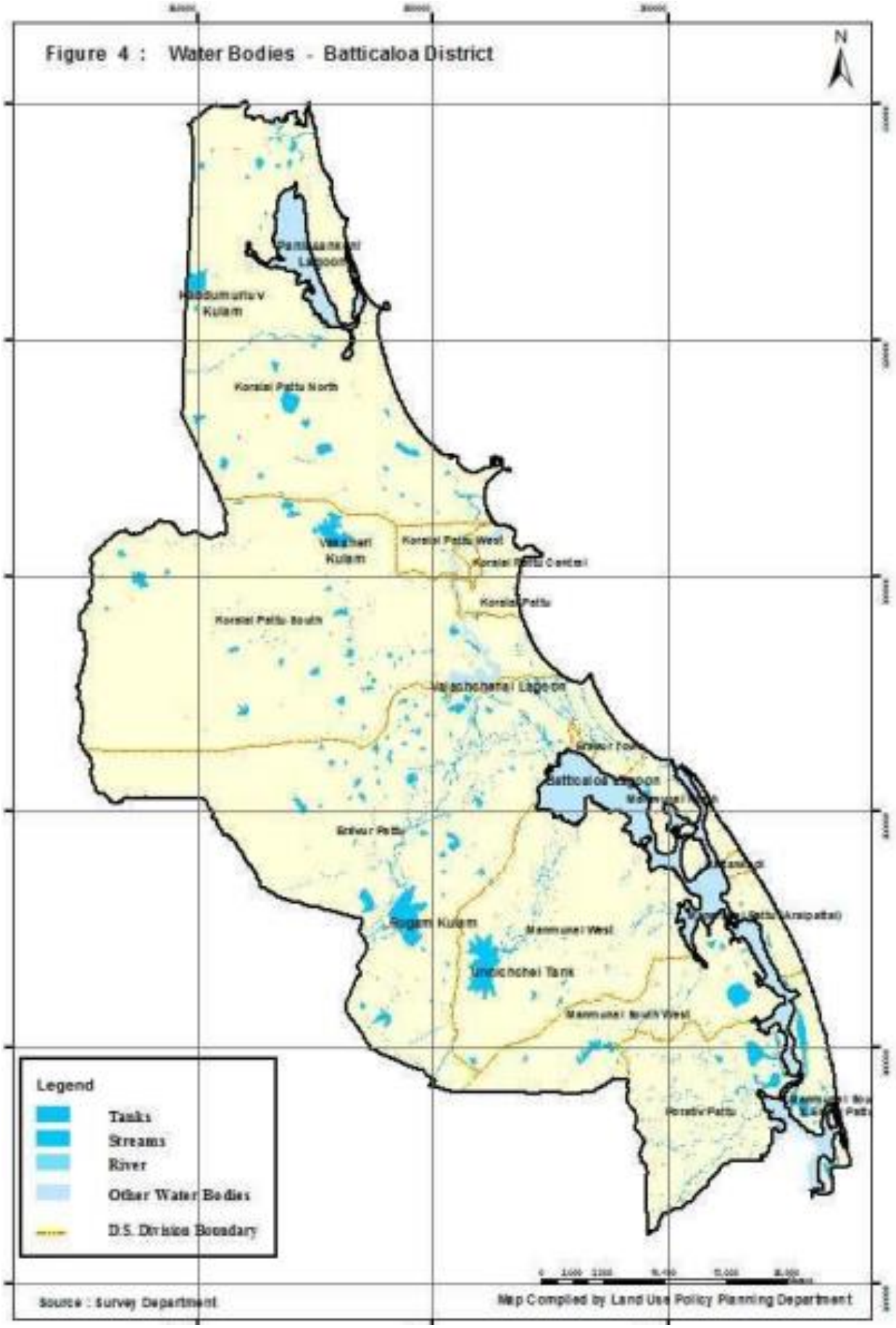
S.N	Beneficiaries Name	Address	NIC No	Contact No	G.N Division
01	Kirupairethinam Mayuran	Cemete Rd, Mankadu	793180535V	0754745580	
02	Mahalinkam Srikanth	Visnukovil Rd,Mankadu	831812559V	0770409991	
03	Selvanayagam Kopalasingam	Beach Rd, Mankadu	197320102281	0706489848	
04	Manikkam Rasenthiram	Beach Rd, Mankadu	19823442190	0757175286	
05	Mayilvahanam Navarethinarasa	Visnukovil Rd,Mankadu	820033868V	0785757654	
06	Kanthappodi Komathi	Beach Rd, Mankadu	775714859V	0779571578	
07	Velmurugu Nesamalar	Beach Rd, Mankadu	19756580833	0766363734	
08	Mahesan Pirapaharan	Beach Rd, Mankadu	852694998V	0764211677	
09	Kunasekaram Thayaparan	Ellai Rd,Mankadu	198332900649	0754713999V	
10	Kumarasamy Nagalinkam	Visnukovil Rd,Mankadu	740954172V	0784689026	
11	Kanthaperumal Kalavathi	Perumal Rd,Mankadu	685911124V	0771360934	
12	Mayilvahanam Pathmarasa	Visnukovil Rd,Mankadu	721704025V	0770439778	
13	Rasenthiram Puvi	Beach Rd,Mankadu	882091830V	0757283230	

S.N	Beneficiaries Name	Address	NIC No	Contact No	G.N Division
01	Selvarasa ledsumi	Murugan kovil west Rd, cheddipalayam - South	525892255V	0755156676	
02	Kuhenthirarajah Pirunthan	Murugan kovil west Rd ,cheddipalayam - South	922231770V	0752387433	
03	Thampipillai Thayagaran	Midwife Rd, Cheddipalayam- South	713003492V	0752900459	
04	Pillaiyan Suntharalinkam	Midwife Rd, Cheddipalayam- South	731573956V	0770836641	
05	Kanapathipillai Selvarasa	Murugan kovil East Rd, cheddipalayam -South	593423344V	0752656795	
06	Pillaiyan Visvalinkam	Murugan kovil Rd, cheddipalayam - South	590362573V	0756847313	
07	Sivaganam	Midwife Rd, Cheddipalayam- South	601465167V	0757234313	
08	Yoganathan Sumitha	Cheddipalayam - North	850164932V	0754294919	
09	Thavarasa Kamalesh	Cheddipalayam - South	785512278V	0776733547	
10	Karunagaran Kokilaranjan	Cheddipalayam - North	880211153V	0759826841	
11	Thampirasa Elango	Cheddipalayam - North	810161213V	0771037927	
12	Thiyagarasa Thevasuthan	Cheddipalayam - South	801691293V	0756746910	
13	Palasuntharam Kugan	Cheddipalayam- South	683041386V	0758250781	
14	Kumarasamy Kopalasingam	Murukan Kovil Rd,cheddipalayam -North	721024466V	0752487993	
15	Venuthas Kiruthika	Public ground Rd	937702418V	0756678941	
16	Sivalinkam Ravindran	Midwife Rd, Cheddipalayam- South	690913682V	0759530942	
17	Nadarajan Vivekanantharajah	Kaddupillaiyar Kovil Rd,Cheddipalayam -South	830592938V	0753024592	
18	Rakupathi Kandeepan	Main Rd, Cheddipalayam - South	781891703V	0758761252	
19	Sivalinkam Pathmavathy	Murugan Kovil Rd,Cheddipalayam- South	735910710V	0752081712	

S.N	Beneficiaries Name	Address	NIC No	Contact no	
01	Kanapathipillai Thillaiyampalam	Somasuntharam Rd,Kaluthavalai-04	602222861V	077535952	
02	Elayathampi Rathinasingam	Vanniyar Rd west,Kaluthavalai -Central	582482497V	0754265512	
03	Alakuthurai Pirunthapan	Pirathesasabai Rd,Kaluthavalai-05	972000078V	0752829838	
04	Thevarasa Kalaiselvi	Vanniyar Rd west,Kaluthavalai -Central	790062990V	0752607088	
05	Ponnuthurai Suntharalinkam	Vipulanantha Rd,Kaluthavalai-Central	593213749V	0758251853	
06	Kumrasamy Sothinathapillai	Beach Rd,Kaluthavalai-04	672543673V	0770832236	
07	Kanthaiyah Perinpanayagam	Church Rd,Kaluthavai -03	603373185V	0757006818	
08	Velupillai Murugesu	Somar Rd,Kaluthavalai-03	641722731V	0758106366	
09	Velmurugu Yoganathan	Beach Rd.,Kaluthavalai-03	743201930V	0754644677	
10	Samithampy Nesarasa	Main Rd,Kaluthavalai-02	573274202V	0778436546	
11	Sothilinkam Kunasunthari	Main Rd,Kaluthavalai-04	587242710V	0779766393	
12	Sinnathampi Amirthalinkam	Kaanady Rd,Kaluthavalai-01	692434030V	0771308504	
13	Rasaiyah Veerasingam	Vasakasalai Rd,Kaluthavalai -04	620733768V	0768805564	

S.N	Beneficiaries Name	Address	NIC No	Contact No	G.N Division
01	Yoganantharasa Megala	Sri murugan kovil Rd,Kurukkal madam, North	637051792V	0755623621	Kurukkal madam, North
02	Sabarethenam Thangamma	Kurukkal madam, North	675523584V	0758552120	Kurukkal madam, North
03	Theyagarasa Vanaja	Kurukkal madam, North	736973367V	0755319822	Kurukkal madam, North
04	Thavarasa Deluxan	Kurukkal madam, North	931003054V	0776919576	Kurukkal madam, North

Annexure 4: Distribution of water bodies in Batticaloa district



Annexure 5: Protected areas of Batticaloa district