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Agriculture Modernization Project

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Ministry of Agriculture
கமத்தொழில் அமைச்சு

Environmental Screening Report

Cluster in Potato Seed Production with New Technology in Wakkadahinna, Keppeitipola

Project Management Unit
Agriculture Sector Modernization Project
October 2021

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Abbreviations

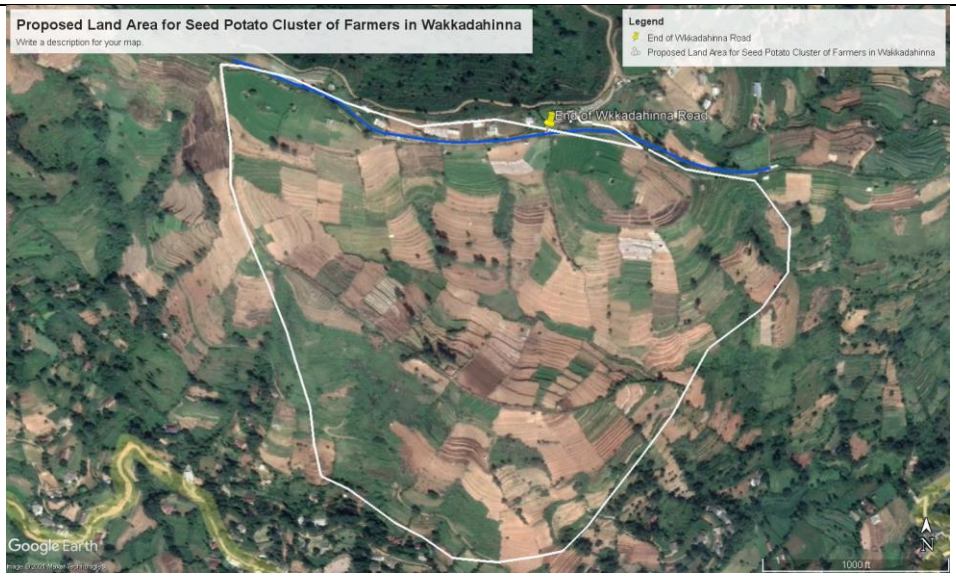
AI	Agriculture Instructor
ASMP	Agriculture Sector Modernization Project
ASC	Agrarian Service Center
ATDP	Agricultural Technology Demonstration Park
CBO	Community Based Organization
DSD	Divisional Secretary Division
EMF	Environmental Management Framework
EMP	Environmental Management Plan
ESR	Environmental Screening Report
FO	Farmers Organization
FPO	Farmers' Production Organization
GAP	Good Agricultural Practices
GND	Grama Niladhari Division
GoSL	Government of Sri Lanka
IDA	International Development Association
IEE	Initial Environmental Examination
IPM	Integrated Pest Management
LGA	Local Government Authority
MOA	Ministry of Agriculture
MOPI	Ministry of Primary Industries
NIRP	National Involuntary Resettlement Policy
NGO	Non-Governmental Organization
OP	Operational Policy
PAP	Project Affected Persons
PCR	Physical Cultural Resources
PMP	Pest Management Plan
PMU	Project Management Unit
SLRs	Sri Lanka Rupees

Environmental Screening Report (ESR)

A. The Project Identification

Project Title	Cluster in Potato Seed Production with New Technology in Wakkadahinna, Keppeitipola
Project Proponent	Agriculture Sector Modernization Project (ASMP)
Purpose and scope of ESR	The purpose of the ESR is to provide viable mitigation measures against all identified environmental impacts during the screening process of the subproject. This ESR includes the basic information of the subproject, justification of the subproject selection, anticipated impact, and socio-economic condition of the subproject area, and community concerns on subproject identification, designing, and implementations, the implementation plan of the viable mitigation measures against the identified environmental impacts. Field level screening checklist is annexed as Annex 1.

B. Project Location

Location	This subproject will directly benefit a total of 340 individual farmers who are continuing their agricultural activities in the Keppetipola and Boralanda areas of Welimada DSD belong to the Badulla District of Uva province. However, this particular year nearly 120 individual farmers from Keppetipola and Vidurapola GNDs will be selected. The location map is annexed as Annex 2.
Location (Google Map) N: $6^0$53'35.29" E: $80^0$51'18.83"	 **Figure 1: Location of the subproject**
Definition of Project Area	The approximate land extent of Welimada DSD is 18,800ha and per capita, land consumption is 0.2ha[1]. There are 340 farmers who are planning to select for this Good Agricultural Practice (GAP) technology.

[1] http://www.statistics.gov.lk/statistical%20Hbook/2020/Badulla/3.2.pdf

(The geographical extent of the project & areas affected during construction)	These proposed lands are in the Wakkadahinna area and should be accessed by Wakkadahinna road which starts at A005 Peradeniya-Badulla-Chenkaladi Road at Padinawala. Wakkadahinna is nearly 3km away from A005. Majority of people who cultivate in Wakkadahinna, daily visit this area as they live in the Keppetipola and Vidurapola area nearly 4km away from the farmlands. Altogether 340 farmers will be directly involved to produce the seed potato on 260 acres extent farmlands under this subproject, about 120 farmers will be selected at the initial stage. The proposed area is predominantly hilly areas where the majority of lands are used as cultivation areas. The area can be considered as intensive vegetable cultivation areas boarded with some tea plantations. All the farmers in the area usually cultivate vegetables during both seasons of the year on their uplands and paddy lands as well. Except for small-scale farmlands, plantation company-owned land of the area is covered by plantation crops such as Tea.  **Figure 2: A Tea cultivation of the area** The main food crop which is grown by the farmers in this area is potato (once a year). As for the vegetable crops, farmers grow carrot, cabbage, beans, radish, tomatoes, capsicum, etc... Farmers do the cultivations nearly three times a year. Farmers have cultivated especially fruit-bearing trees and timber trees as the perennial crops on their home gardens.

	 **Figure 3: Existing Vegetable cultivation land in Wakkadahinna**
Adjacent land and features	According to the statistical data of the Department of Census (2020), household land consumption in Welimada DSD is nearly 0.7 ha. The minimum land requirement for seed potato production per one farmer is 0.2 ha (nearly ½ acre). Adjoining the proposed land area is predominantly agricultural lands basically vegetable cultivation. In addition, the area is boarded with some Tea plantations belonging to a private estate company named Malwatte Valley Plantation. In addition, Kande Ela is passing through these lands and it enables easy access to water for farmers. This area is a top of a hill and the selected lands are basically along one basin. The habitat types are including grassland, cultivated area, home gardens, and secondary vegetation. There are forest cultivations owned by Forest Department and State Timber Cooperation harvests timber from these timber plantations. Hakgala Strict Natural Reserve is located nearly 15 km away from the Boralanada area and10 km away from the Keppetipola area.

C. Project Justification

Need for the project (What problem is the project going to solve	Potato (***Solanum tuberosum L***.) originated in the Andes highlands in Peru and Europeans who settled in hilly areas introduced it to Sri Lanka in the 1850s. At present potato is extensively cultivated in the district of Nuwara Eliya (Upcountry wet zone >1000m AMSL) in two major seasons, "Yala" (Feb - July) and "Maha" (Aug - Dec.) where annual rainfall is >2,500mm and temperature ranges between 10-150C with the relative humidity of 80%. It is also widely grown in Badulla District (Up Country intermediate zone- 1000 to 1500 m MSL) in paddy fields and high land during "Yala' and "Maha" seasons respectively. This area experiences rainfall of 1500 - 2250 mm annually with 70 % RH and 15- 22 0C range in temperature. Puttlam and Jaffna are the other two districts where the potato is grown to a lesser extent. The annual domestic potato production which is generally about 80,000 tons is about 40% of the domestic consumption requirement of 200,000

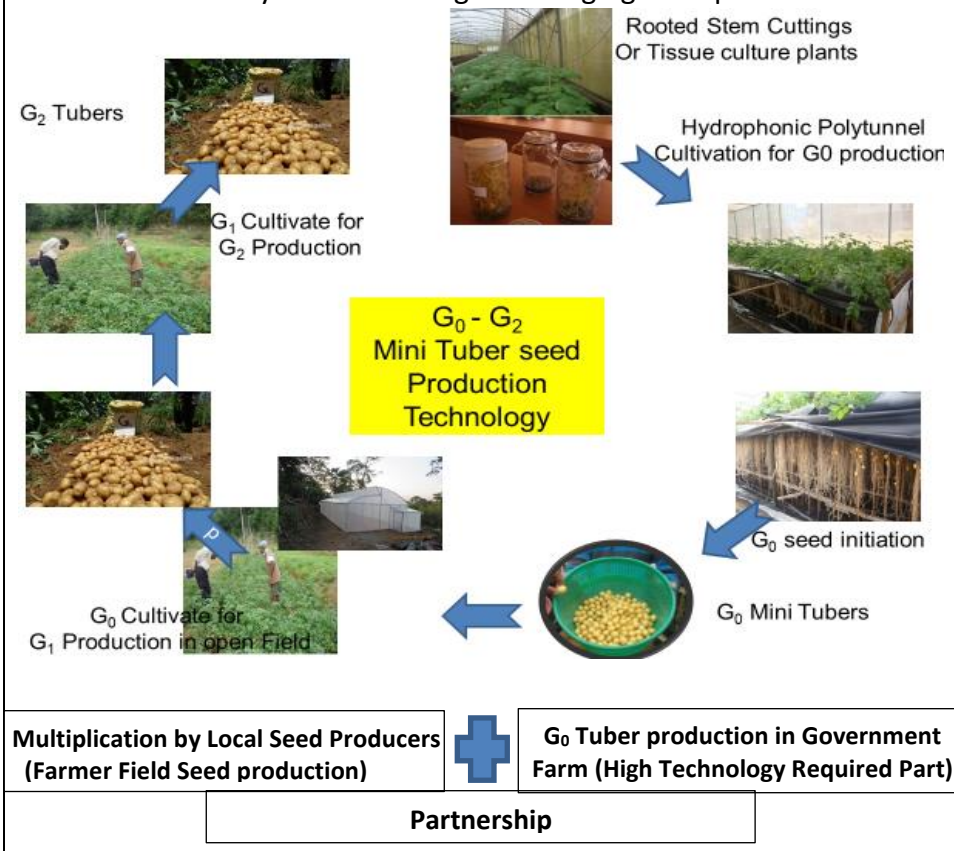
	tons. The balance requirement is about 120,000 tons is imported annually incurring a foreign exchange cost of about SLRs. 5,100mn. The potato extent and production of Sri Lanka have been stagnating with slight annual variations over the recent years. The average productivity of potatoes in Sri Lanka has been stagnating around 16 t/ha which is below the average yields of the neighboring countries. Relatively low productivity increases the price of local potatoes than the imported products and the farmers have to compete with the low price imported potatoes. Local potato farmers get at risk of price fluctuation during the harvesting period and economic losses are happen as the result of this market behavior. The low productivity directly affects the increase of the cost of production resulting in less profit margin to the potato farmers. The present annual unit cost of the production of potato is about SLRs 55.00 to 60.00/kg of which about 50% is incurred on the seed. The annual extent of potato cultivated is about 5,000 ha that needs about 12,500 tons of seed tubers to be cultivated. About 70%% of the seed requirement is met with seed produced by farmers themselves, and 8% of the annual seed requirement is met with seed produced in government farms. While another 10% of seeds are being imported annually. Additionally, 12% of the annual seed requirement is supplied by small and medium-scale seed suppliers. Seeds produced by farmers are generally below the required standards of quality but the unit cost of imported seed is about SLRs 400/kg, and this high cost discourages farmers to purchase quality seed. Usage of lower quality seed is considered as the main reason for lower productivity of the domestic potato sector, and the high proportion of the cost of seeds in the unit cost of production reduces farmers' profitability and reduces incentives for expanding production. Supplying high-quality seed at a lower cost has become a critical necessity to break the lower productivity-based vicious cycle of stagnating domestic extent and production of potato, and associated impediments on efforts for reducing the high foreign exchange cost incurred annually on potato imports. The Department of Agriculture implemented a project on increasing high-quality seed production through rapid seed multiplication and has obtained successful results that seemed to lead to slight increases in domestic potato productivity. The previous project of the Department of Agriculture expanded the Rapid Multiplication of potato seeds within Polly Tunnels by the expansion of area under Poly Tunnels that produce early generation seed (G0 or G1). However, the full benefit of that project could not be achieved since the expansion of the multiplication cycle at farmer fields was below expectations due to a lack of proper implementation of appropriate agronomic practices. The lessons learned from that project indicates that high-quality seed at a lower cost can be produced at farmer fields with the adoption of improved agronomic practices and

	multiplication of early generations of seeds (G0 or G1) produced at Poly Tunnels. Focusing to achieve the above targets, ASMP and DOA officers have identified nearly 340 farmers who are already cultivating potatoes in Welimada as the beneficiary farmers to produce seed potato at field level. However, at this stage, about 120 farmers will be selected as beneficiaries.
Purpose of the project (*what is going to be achieved by carrying out the project*)	The project will directly benefit 340 farm households. The early generation potato seeds, a sprinkler irrigation system for ½ acre extent, and a water pump for each beneficiary farmer will be provided as the material inputs for high-quality seeds potato production. Second, this subproject will serve nearly 5,000 farmers by providing high-quality seed potatoes for their cultivations. Eventually, they are also getting benefits from this subproject. The list of the selected beneficiaries for the seed potato cluster is presented in Annex 03 (at present, it is only about 120 farmers). The general objective of the subproject is; • To increase the production of high-quality potato seeds at a low cost, through private seed producers in the Badulla district, and thereby raise productivity and profitability of the crop. The specific objectives of the subproject are; • To expand the existing seed potato (G0) production facility at the DOA complex in Seetha Eliya, Nuwara Eliya to increase initial seed (G0) production. • To increase production and supply of high-quality seed potato locally at a low cost through private seed producers of Badulla district. • To improve productivity and quality of potato seeds produced by farmers themselves in Badulla district through introducing modern technologies. • To improve the production, storage, and marketing system of potato seeds through strengthening private seed producer organizations and developing business partnerships The expected outcomes of the projects are; • To supply the high-quality seed potato requirements to cater to at least 5,000 growers in the area • Promote the potato growers to produce their own seed potato requirement through their cultivation cycles by practicing Good Agricultural Practices • Reduce the utilization of low quality locally produced planting materials (seed potato) for cultivation to maintain the healthy cultivation and enhance the productivity • Reduces the share of imported seed potato by replacing high-quality locally produced seed potato at a low price and saving the import cost

	The ultimate effort of the ASMP is motivating farmers for using good agriculture practices (GAP) in their cultivation activities by introducing new technologies.
Alternatives considered (*different ways to meet the project need and achieve the project purpose*)	The existing seed potato requirement is fulfilled by the imported seed, locally produced seed potato, and seed produced by farmers themselves. The potato research institute together with DOA produces high-quality seed potato but its share of seed potato requirements is negligible. Hence, DOA has to take a vast effort to multiply the seed production through the field multiplication program. Hence, they have practiced this system for many years and they do have not enough resources to expand it. Therefore, ASMP has identified the need for a subproject and decided to uplift the seed production through the new system already resulting in good outcomes. The "site alternative" would mean the feasibility of meeting the project needs at the selected cluster. Wakkadahinna in Keppetipola and Vidurapola has a well-established farmer organization already and production of Potato with high quality. There are experienced potato farmers and the majority of farmers in these areas rely on vegetable cultivation including potatoes (one season) for livelihood. Hence, the selected area is highly supportive to meet the project needs within a short period of time with the expected quality. The "no-action" alternative would mean that no Seed Potato Cluster Development undertaken by the ASMP and hence no financial, technical, and market support for the government to produce seed potato which is a critical requirement in the area for potato farmers. Therefore, support for the production of seed potatoes in the area by ASMP would enhance potato cultivation and it is a good intervention as a government organization in terms of reducing the import volumes of potatoes.

D. Project Description

Proposed Start Date (Duration)	November 2021 (06 Months)
Proposed completion Date	April 2022
Estimated total cost	SLRs 147.23MM
Present Land Ownership	The seed multiplication activities will be undertaken by the beneficiary farmers on their own private lands. Farmers have had government permits to cultivate their lands for many decades. These permits are issued by DS-Welimada. Therefore, no private or state land acquisition will be required for the subproject.
Description of the Project	This subproject is mainly focusing to produce the seed potato requirement of the Badulla district. Initially, its target was to produce the

(*With supporting material such as maps, drawings etc. attached as required*)	seed potato requirement of the 5,000 farmers in the district. The DOA and ASMP together have designed the subproject to get maximum expected benefits from potato production in the country. The proposed seed potato production program consists of four different sub-components. The seed potato production process has two main phases, the first phase is undertaken by the DOA within their farms and laboratory premises and the second phase of the process will be undertaken by the beneficiary farmers on their privately owned farmlands. For easy understanding following figure is presented.  **Figure 4: Conceptual Framework** The DOA has the improved potato varieties at their farm in Seetha Eliya which is the sole state institution pertaining to the production of seed potato and the research purposes. There are laboratory facilities in Bandarawela farm owned by DOA and this institute will also be engaging in this subproject. The DOA technical experts will select the high-yielding healthy varieties suitable for multiplication. Initially, they produce the tissue culture[2] plants using stem cuttings of the potato plants at their labs in Seetha Eliya Farm.

[2] **Tissue culture** is the growth of **tissues** or cells in an artificial medium separate from the parent organism. This technique is also called micro propagation. This is typically facilitated via use of a liquid, semi-solid, or solid growth medium, such as broth or agar

	The tissue culture plants will be grown in poly tunnels as hydroponic cultivation[3] and produce the Generation-0 (G0) mini tubers. Then DOA undertakes a process to enlarge and harden the tubers by cultivating within poly tunnels and the open field at Seetha Eliya potato farm. The Beneficiary farmers will receive the G0 seed potato and they will cultivate and manage the crop to produce the Generation 1 (G1) seed potato and again the same cultivation pattern will be done by the beneficiary farmers to produce the Generation 2 (G2) seed potatoes. This sub-project will initially involve producing up to G2 seed potato and this yield will be supplied to potato farmers in the Badulla district as the food crop. Parallel to the potato seed production undergoing on the government farm and the beneficiaries' farmlands, the required testing will be done by the Bandarawela research center. The sub-project consists of 4 different sub-components. They are; **<u>Activity 1</u>** Expansion of existing G0 production unit at Seetha Eliya Government farm to produce Go and G1 seed requirement of seed producers in Badulla District. It is proposed to establish 4 new poly tunnels 400m2 size each and convert 12 existing geophonic tunnels to aeroponics, at Seetha Eliya farm to produce G0 tubers with aeroponics technology with aim of increasing present production of 3mm tubers to 7.5mm tubers annually. The expansion also includes a hardening unit for G0 tubers, the establishment of a cold storage facility for seed storage, and the establishment of an RO filter to have high-quality water for aeroponics. Further, the tissue culture laboratory facilities at Seetha Eliya & Bandarawela research stations will be improved providing necessary equipment to meet the increasing demand of the tissue culture plants requirement of G0 unit at Seetha Eliya. In addition, the soil testing facility at Bandarawela research station will be strengthened to accommodate testing of soil samples of proposed seed potato producers in the Badulla district. **Activity 2. Increase seed production by small & medium scale seed producers in Badulla district.** A Group of seed producers in Keppetipola and Boralanda areas is proposed to carry out a field multiplication program of G0 and G1 produced at Seetha Eliya and maintain high-quality potato seed supply to local farmers at a reasonable price while maintaining potato seed production as an economically viable enterprise. About 400 no. of seed producers having a suitable land area of ½ acre or above will be selected considering their willingness and provide them with some of the production inputs such as sprinkler irrigation system with water pump,

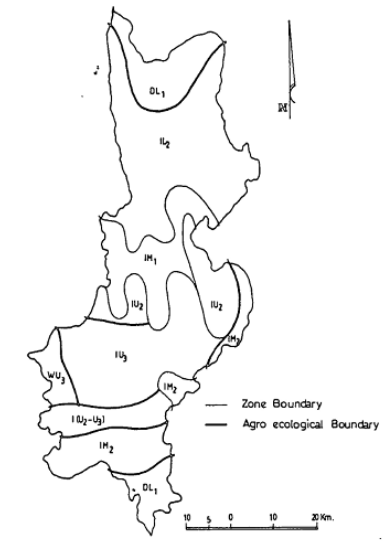
[3] **Hydroponics** is a way to skip the soil, sub in a different material to support the roots of the plant, and grow crops directly in nutrient-rich water. There are multiple approaches to designing **hydroponic** systems, but the core elements are essentially the same

	Seeds G0 or G1, water tank and facilitate soil testing. At 1st stage, the total targeted extent under seed production is about 300 acres. **Activity 3. Improve Quality of Self Seed produced by farmers** It has been estimated that about 70% of the annual seed potato requirement is met with seed produced by farmers themselves and found the quality of some seeds produced by them are below the expected standard which leads to lower productivity. Thus, it is proposed to carry out a technology transfer program among potato growers in the Badulla district to introduce a technology package on the quality of seed production and productivity improvement of potatoes. Conducting training programs and exposure visits are proposed to train a group of officers and select 5,000 farmers in the potato growing area. Training of trainers' program will be conducted for selected officers of the provincial department of agriculture and they will act as resource persons during farmer training. **Activity 4. Organize marketing system for local seed potato produced by proposed project supported seed producers** Project-supported seed producers will have grouped into two and two farmer producer organizations will be formed to manage the production and marketing program of locally produced Seeds. Organizations will be supported with two cold storage facilities as common market infrastructure and introduce branding, packaging labeling procedures for market promotion The sub-activities with the cost allocation under the subproject are presented in Annex 4.
Project Management Team	A Project Management Unit (PMU) has been established under the Ministry of Agriculture to implement the proposed project activities. Contact Persons : **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/ **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 and field visits to the project site.

E. Description of the existing environment

1. Physical features – Ecosystem components	
Topography and terrain	Generally, the project area covers a hilly and rolling terrain with a high slope (slope 40-60%). Geologically, the project area belongs to the highland Complex of Sri Lanka and the elevation is around 1,000m AMSL. Particularly, the Wakkadahinna area lies about 1200m MSL. Generally, the project site is having high elevated ridges and mountain ranges, plateau and undulating plains, and basinal structures. The project site falls into the upcountry intermediate of Sri Lanka and the features of this area are belong to IU2 agro-ecological zone.
Climate and Meteorology	The average temperature is 18.9 ºC and the maximum and minimum are 22.0°C and 15.0°C respectively. The average annual rainfall varies from 1,750mm to 2,500 mm and averages of 2,000mm. Relative Humidity varies from 75% during the day to 95% at night. The Uva Basin however lies in the rain shadow during this season. During the first inter-monsoon season (March to mid-May) the whole district receives about 300-500 mm of rainfall. The district lies in the lee of the Central mountain range during the Southwest monsoon season which extends from mid-May to September.
Soil (*type and quality*)	In the hilly area, the soil is dominated by Red Yellow Podzolic type and Mountain Regosols type could also be observed in a few locations. Geology of the area could be classified as “Highland Sires” with garnet-sillimanite, schist and gneiss, quartz feldspar, granulite, charnokitic gneiss, pyriclasite, pyroxenes, and amphibolites, etc. The area belongs to landslide-prone areas as per the Soil Conservation Act of Sri Lanka.



DL_1	Dry Zone	Low Country	> 30	75% EXPECTANCY VALUE OF ANNUAL RAINFALL inches.
IL_2	Intermediate Zone	Low Country	> 45	
IM_1		Mid Country	> 55	
IM_2			> 45	
IU_2		Up Country	> 55	
IU_3			> 45	
WU_3	Wet Zone	Up Country	> 55	

Figure 5 : Agro-ecological Zones of Badulla District

Surface water (*sources, distance from the site, local uses and quality*)

As the open water bodies, seasonal and perennial streams are located within the Welimada DSD. Meepilimaana Tank is located about 20 km away from this area and the main feeder canal is running through the Keppetipola and Boralanda area. However, the Wakkadahinna area is fed by Kande Ela (Ch: 5+542km). Farmers mainly use this water source for cultivation. In addition, there are many springs are located in the area and it is identical features.

Use: The main surface water source of the area streams. The use of surface water for domestic purposes and agriculture is common.

Quality: The quality of surface water in the area in is good condition

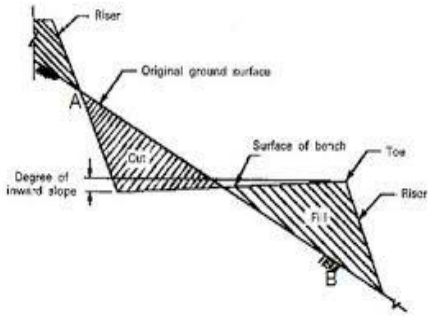
Figure 6 : Kande Ela Canal runs through proposed area

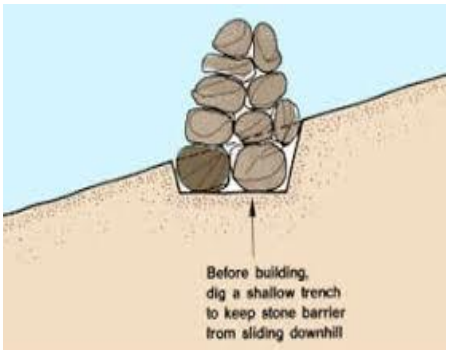
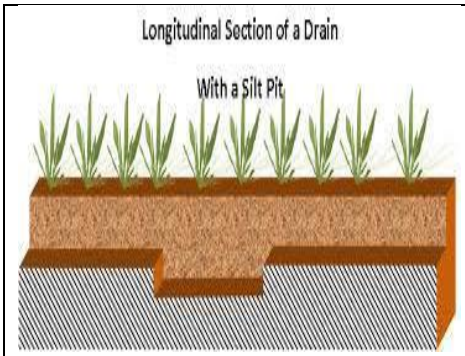
Ground water (*sources, distance from the site, local uses and quality*)	The data on groundwater availability in the project area is very sketchy, and therefore it is not possible to exactly quantify the availability, yield, and capacity within the project area. However, the quality of groundwater present in this area is moderate in condition and use for washing/ bathing activities.
Air quality (*any pollution issues*)	Any major pollution source near the project area is not recorded
Noise	No any noise pollution sources in the vicinity of the project site.
2. Ecological features – Eco-system components	
Vegetation (*trees, ground cover, aquatic vegetation*)	The predominant land use type of the project area is agriculture. Apart from vegetable cropping lands, the rest of the area consists of plantation crops and state-owned lands are being utilized for timber plantations. The identified farmlands are located within several habitat types including grassland, cultivated area, home gardens, and secondary vegetation.
Presence of wetlands	No wetlands present in the area proposed for the subproject
Fish and fish habitats	Open water bodies such as Kande Ela are water bodies that are ideal for fish habitat. Further, there are pots constructed by the farmers to store water also found with freshwater fish varieties.
Birds (*waterfowl, migratory birds, others*)	The proposed project area is closer to the waterways and agricultural lands and there is a possibility of recording bird species in these habitat types.
Presence of special habitat areas (*special designations and identified sensitive zones*)	The Hakgala strict reserve forest is located about 10km away from the sub-project area. It is highly enriched with diversified flora and fauna species. According to the sensitive area map produced by the Central Environment Authority (CEA), Welimada DSD is considered as sensitive as this particular locality is listed under landslide-prone as well as erosion-prone areas. But the proposed farmlands have been applied with good soil erosion control measures to avoid erosion.
3. Other features	
Residential/Sensitive Areas (*E.g., Hospitals, Schools*)	The subproject activities will be undertaken at households' level privately owned by farmers.
Traditional, economic and cultural activities	The total population of Selected two GNDs (Keppetipola and Vidurapola) is 4,903 comprises 49.9% males and 50.1% females. Per head land use is around 2.9 ha and per household land use is 9.8ha. Out of the total workforce, 28.2% is employed in agriculture sector activities, 14.3% is engaged with the manufacturing sector, 13.9% is employed in the industrial sector and 12.1% is engaged with skilled labor category. Other sectors are minor and have a low contribution to the economy. With compared to other areas selected for ASMP, this district shows a high percentage of occupants in the manufacturing sector and skilled labor sector The average monthly household's income is SLRs. 32,580/= and

	the average monthly household's expenditure is SLRs. 31,807/-. The community who lives below the poverty line is around 11.3 % (Statics in 2012/13). With compared to other areas selected for ASMP, this district shows a high percentage of occupants in the agriculture sector. A high percentage of the community is poor and lives below the poverty line). There are no major irrigation systems in this area and all farmers have converted their paddy cultivation land into vegetable growing sites. During both seasons, farmers cultivate vegetable crops on uplands and low lands. During Yala season; farmers are cultivating vegetable crops with irrigated water. The farmers have constructed their residential houses on upland and timber trees & fruit-bearing trees are planted in balance parts of the land. The Traditional, economic and cultural activities were not observed.
Archeological resources (*recorded or potential to exist)*	The proposed subproject will be located on privately owned lands and there is no archeological or Physical Cultural Resource (PCR) to record or potential to exist.

F. Description of Proposed Agricultural Activities

1. Cultivation	
Existing Condition of the Crop	The farmers who live in Welimada DSD are mainly cultivating vegetable crops on their farmlands. Among this cultivation pattern, the cultivation of potato has a leading part in the area. Even though the government institutions and private sectors are providing various inputs to the agriculture sector, farmers commonly face constraints in potato cultivation. The main constraints pertaining to potato cultivation are mentioned below; • High Cost of seed materials • High Cost of Production • Low Quality seeds • Non availability of seeds in time • Low productivity • Inadequate suitable lands • Disorganized marketing system and week farmer organizations The DOA had previously launched the production of seed potato as a pilot project with outside funds. But the process was not popular due to the constraint in funding. Now, DOA is willing to give their maximum inputs for this subproject with their vast experiences.
2. 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	The potato can be grown almost on any type of soil, except saline and alkaline soils. Naturally loose soils, which offer the least resistance to enlargement of the tubers, are preferred, and loamy and sandy loam soils

	that are rich in organic matter, with good drainage and aeration, are the most suitable. Soil with a pH range of 5.2-6.4 is considered ideal. Before the land preparation is starting, soil testing will be done as a part of this subproject. The soil sample will be sent to the Bandarawela research center and they will issue the fertilizer and soil recommendation for individual land after a series of tests. The manual weed control will be done by the farmers and the crop residuals of the previous cropping cycle will be burnt to maintain the hygienic condition in the sites. The farmers usually add cow dung and poultry litter as the organic manure to the farmlands during the land preparation. Adding organic manure enhances the water holding capacity of the soil in addition to the nutrient supplements. Farmers prepare 30-40 cm height soil ridges to plant the seed potato and it will facilitate to drain out water. Parallel to the seed potato production programme, soil conservation measures will be undertaken by the farmers to protect their farmlands from soil erosion. The Natural Resource Management Center (NMTC) will provide the required technical assistance and training to the farmers. Farmers have to establish the soil conservation measures in their farmlands according to the directions of NRMC before start the potato cultivation activities. Few soil conservation measures that are suitable for the identified lands are given below; **1. Soil terraces**- Terraces are earthen embankments built across the dominant slope partitioning the field in uniform and parallel segments. Generally, these structures are combined with channels to convey runoff into the main outlet at reduced velocities. It reduces the degree and length of slope and thus reduced runoff velocity, soil erosion and improves water infiltration. It is recommended for the lands having a slope of up to 33% but can be adopted for lands having up to 50–60% slope, based on soil condition  Figure 7: Sketch of a Soil Terrace  Figure 8: Well developed soil terraces **2. Stone walls-** Stone walls are effective for preventing runoff rate and severe erosion in steep land, and most suitable for high elevation areas of the catchment. Stone walls are used to stabilize the steep slopes of >40%. These structures are cheap, having a long life, and fewer maintenance requirements. The depth of stone walls base is about o.3 m

	and flat stones of 20–30 cm size are used for the construction of walls. A spillway is provided in the middle of the wall to allow the safe discharge of runoff water. These structures are suitable for sedimentation, control erosion, and to conserve soil moisture  Figure 9: Cross section of a stone wall  Figure 10: A field conserved with stone walls **3. Lock and Spill drains**- Lock and spill drains are constructed at the contour line to reduce the runoff velocity for soil moisture conservation in the areas having <30% slope. Bunds are formed on the downstream side of trenches for the conservation of rainwater. Lock and spill drains are constructed based on the size and the slope of the field. The space between two drains varies based on the sloppiness, low space is for steep areas, and high space for low slope land. The width of the drain is about 30-45cm and the length is depending on the size of the field. The lock structures are constructed at the bottom of the drain to enhance the sedimentation and keep the soil moisture. Comparatively, these structures are cheaper in construction. After each rainy season, deposited silt is removed and incorporated into the field. Cultivation of a grass hedge on the upper edge of the drain additionally helps to control the erosion as it acts as a silt trap. For the grass hedges, it is recommended to cultivate 'Savandara' (Botanical name- ***Chrysopogon zizanioides***) as it has a good root system and controls soil erosion, and keep the soil moisture too  Figure 11: Longitudinal section of a lock and spill drain  Figure 12: Newly constructed lock and spill drain
Water requirement[4]	The soil moisture content must be maintained at a relatively high level. For best yields, a 100 to 110-day crop requires from 200 to 220 mm of water. In general, water deficits in the middle to late part of the growing

[4] The potato: Cultivation - International Year of the Potato 2008 (fao.org)

	period tend to reduce yield more than those in the early part. Because the potato has a shallow root system, yield response to frequent irrigation is considerable, and very high yields are obtained with mechanized sprinkler systems that replenish evapotranspiration losses every one or two days. The water requirement for the crop is estimated as 2,000 liters per day per ½ acre extent. Currently, farmers use open drains to irrigate potato cultivation and it is a high water wasting system while spreading the diseases via it. Under this subproject, sprinkler irrigation is provided for the farmers and it will reduce water wasting and will help to maintain a healthy crop.
Use of fertilizer, pesticides and weedicides	Overuse of chemical fertilizers and agrochemicals is a common phenomenon in potato cultivation in Sri Lanka. Therefore, DOA has proposed to do an early soil test to identify the real requirement of plant nutrients to avoid the excessive use of the fertilizer. It is a Good Agricultural Practice since it directly affects environmental pollution and economic losses. The soil analysts will give recommendations for both chemical fertilizers usages and adding organic manure to the crop. And it will indirectly reduce the use of chemical fertilizers. Initial weed control prior to cultivation is only done manually. After the establishment of the crop in the field, using agronomic methods such as controlling watering, following cultivation cycle, and timely application of the recommended fertilizers are practiced. It is recommended to minimize the usages of the agrochemical such as pesticides and fungicides. Farmers' technical know-how to identify the economic thresholds level in pests control will be enhanced as a part of this subproject through the experts in DOA. When the pests attack to overrun the economic threshold level, an integrated system with less chemical application will be allowed to control the pests. Farmers to use chemical fertilizer for potato production. 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. To control pests and diseases, there are several crop management methods apart from pesticide application. They establish the crop at the proper time, proper land preparation, destroy crop residuals, Manually destroy the eggs and larva, and weed control. Further, DOA has recommended crop rotation to minimize the pests and disease attacks to potato cultivation. According to their recommendations, only one crop of potato per year will be cultivated in proposed seed-producing lands and crop rotation will be practiced by cultivating vegetable crops during the rest of the period in the year. Farmers will be advised to avoid cultivating crops belonging to the Solanaceae family for crop rotation To control pests and diseases, there are several crop management methods apart from pesticide application. They are; • Selection of high-quality initial seeds from a reliable source

	• Use of treatment for planting material before planting • The correct time of planting • Use of recommended fertilizers at the correct rate and correct time of application • The high amount of nitrogen fertilizer (urea) may increase the susceptibility to pests. Therefore, excessive use of nitrogen fertilizer must be avoided • Foliar liquid fertilizer can be used when potato plants show deficiency systems. The fertigation units will be provided to each farmer to connect with sprinkler irrigation and add liquid fertilizer to the crop • Use of sprinkler irrigation methods ***Phytophthora infestans*** is an oomycete or water mold, a microorganism that causes the serious potato disease known as potato blight. This is a common disease among the crop in the area. Applying the recommended fungicide is the solution to mitigate the issue. Integrated pest management (IPM) is encouraged to control the pest and diseases in crop management as per the pest management plan (PMP) prepared for ASMP. If it is essential to apply agrochemicals, only recommended applying registered chemicals under the Department of Agriculture and PMP as well.
Harvesting	Seed potato can be harvested 100-110 days after planting
Post-harvest storage and transportation	Nearly 25 plastic craters will be provided to each farmer to store the harvest. Two storage and processing units will be constructed at Keppetipola and Boralanda area. And these centers will be supported with two cold storage facilities as common market infrastructure and introduce branding, packaging labeling procedures for market promotion.
3. 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 to keep the hygienic condition of the farm lands.
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).

G. Application of an Integrated Pest Management Practices on Seed Potato Cluster

SN	Crop stages	IPM Practice/ practices	Impacts of IPM Practices	Benefits
1	Pre-Land preparation stage	• Crop rotation of once a year • Proper removal of debris, residues, and host plants (Buring, dumping, compost making) - Keep land clean. • Deep ploughing during dry seasons • Strict sanitation requirements must be followed in growing seed potatoes • Seed treatment • Seed quality and certification	• Proper crop rotations enhance soil fertility, maintain soil structure, reduce certain pest problems, increase soil organic matter, and conserve soil moisture. • Fewer incidents of Pest, diseases, and weeds, • Improvements in aeration in the soils • Sanitation is essential to the prevention of seed piece infection during cutting and handling, and prevention of the spread of the pathogens in contaminated soil, water, and field equipment. • In order to prevent infected seed tubers, one must start with Healthy stock. Stem cutting and micro-propagation techniques have been developed to obtain pest-free potato plants for propagation and production of certified seed tubers.	Farmers maintain pest and disease-free fields
2	Land preparation stage	• Deep ploughing and making soils into fine tilth using a rotavator. • Removal of weeds and their residual parts (tubers and rhizomes etc.) • Sun drying, adding cow dung and compost • Proper Irrigation (Sprinklers)	• Destructions of pests • Control weeds growth • Availability of soil water is a major factor that determines the yield and quality of the potato crop. • Too little water will reduce yields, and induce tuber malformations. • Excess or poorly timed irrigation may reduce Yield or in storage or leach nutrients from the root zone. • Fluctuations in water availability favor disorders such as second growth and internal necrosis. • Sprinkler systems provide the most flexibility and most efficient water application, and fertilizers and some	• A low incident of pest attack • Low water stagnation leads to healthy plants and low virus wilt diseases

SN	Crop stages	IPM Practice/ practices	Impacts of IPM Practices	Benefits
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 infected plants • Select diseases/pests resistant cultivars	• Healthy plants • Cultivars resistant or tolerant to disease can help reduce losses caused by some soil-borne pathogens and provide long-term, economic protection from conditions • That otherwise could inflict severe losses every season.	Low incidence 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) • Border planting (selecting insect-repelling plants)	Pest and disease-free fields	Low incidence of pest and disease attack
5	Juvenile stage (Sprout)	• Identifying pest, disease attacks • Proper Removal of infected seeds. • Sprout Inhibitors should not be applied for seed potato	• Pest and disease-free fields • Weeds free fields	Low incidence of pest and disease attack
6	Harvesting stage	• Controlled watering by using a sprinkler system • Before harvest, the infected vines must be killed using chemicals to destroy late blight spores that could be in contact with the tubers. • Prevention of bruising is one of the most important considerations in well-managed harvest operations. • Blackspot and shatter bruises can seriously affect marketable yield if	• Pest and disease-free fields • No pest and diseases spreading	Low incidence of pest and disease attack

SN	Crop stages	IPM Practice/ practices	Impacts of IPM Practices	Benefits
		precautions are not taken to reduce them		
7	Storage stage	The storage facilities have controls for temperature, humidity, and ventilation.	Ventilation is essential during storage. It removes heat and excess moisture that may condense on colder tubers, and heat produced by respiration; at the same time it helps provide even temperature and humidity within the storage area and oxygen to support tuber respiration	Sustainability of seeds and reduce damage during storage
8	Transport stage	Proper packing in hygienic gunny bags and transport	No pest and diseases spreading	Low incidence of pest and disease attack

H. Socio-economic Environment

1. Stakeholders and Public consultation	
Stakeholders engagements	The Department of Agriculture is the main technical expert who assists to implement the subproject. Agrarian Service Department, Uva Province Agriculture Department is also engaging with the subproject since they are directly mobilizing the agriculture extension service at the field. The GNs of particular GND represents the DS- Welimada for the subproject identification stage. Two Farmers' Organizations will be formed representing the beneficiary farmers at two locations (Boralanda and Keppetipola). In the future, they will act as the field-level institutional part of this subproject. The ASMP field staff and other key stakeholders conducted consultations to identify the interested groups on the subproject. Subsequently, the project staff together with DOA conducted a series of awareness to enhance interested farmers' knowledge in the subject area. The selection criteria looked at the farmers' ability to support with the beneficiary contribution for necessary capital investments, capacity to carry out the activities, hire laborers, pay utility & other running costs, to follow instructions and engage in the sales agreement, etc., Further, the availability of perennial water source for irrigation purposes was a fundamental criterion for the selection of beneficiary farmers. Special attention was given to identifying the farmers who are already engaging with potato cultivation. And land prone to soil erosion was excluded from the list since it helps with environmental issues. Special attention and priority were given to select women, farmers, including vulnerable and disabled farmers as beneficiaries living in the area as well.
Stakeholders consultation	During the social and environmental screening process, the Provincial Project Management Unit- Uva Province of ASMP, Pradeshiya Sabha, Provincial Engineering Service Department, and the GNs were consulted. Meantime ASMP has taken actions to conduct the stakeholders' consultation starting from the subproject identification stage up to finalizing the subproject's design. It was a good tool to maintain transparency within the stakeholders and the community as well. Due to the impact of the fruitful consultation process undertaken by the ASMP, all stakeholders actively get to participate in subproject monitoring activities.
Community Consultation	The initial consultation meeting was conducted by ASMP with the participation of DOA and Farmers organizations and other stakeholders to explain the subproject at the GND level. The community presented their concerns on the cluster activities during discussions. The identification of beneficiaries will be done in a transparent manner and

at the initial stage, about 120 farmers will be selected who comply with eligibility criteria. During the social and environmental screening process, individual consultations had with the surrounding farmers.

Table 1: Consultation outputs

Name	Detail	Matters Discussed/ Suggestions
P.S.K. Pathirana (Male, The Social Mobilizer of the EU Cluster Program deployed by ASMP)	Has more than 20 years of experience in soil conservation activities of upland and good agricultural practices on vegetable cultivation in the area.	He mentioned that he visits often the Keppetipola and Vidurapola GNDs where the beneficiary farmers of the program live and creates awareness. He has maintained a good rapport with the beneficiary farmers.
W.M. Podimanike (Female, 68 years old, widower),	She has no permanent income and depends on the social welfare scheme of the government. 	She mentioned that she is not a beneficiary farmer of the cluster program but there will be available a labor requirement in the village by enhancing the potato farmers' activities. Then she will have a chance to earn by working on the potato farmlands. In addition, improving the existing road will decrease the transportation cost and the time. Currently, three-wheel taxis charge SLRs. 350/- to 450/- per one time from Keppetipola town to the village. If the road is in good condition the cost will be decreased up to SLRs. 250/- to 300/-. Therefore, it will be a positive gain for them.
S. Sivaneshvaran (Labour, 47 Yrs.)	He is working in Malwaththa-valley Plantation as a Labor and lives with his wife and a daughter. 	He has cultivated vegetables requires only for his daily consumption at his home garden. No land to grow the vegetables on a commercial scale. When we visited the site he was cleaning the roadside drain near his home garden. Due to absence of the road regular maintenance, the edge of his home garden is wash off during the rainy season. Therefore, road

			improvement is highly appreciated by him. He mentioned that poor road condition is one of the reasons for high transport cost and it will decrease definitely after the road improvement.
	V.Kanthini (47 Yrs., Female labor in Malwaththaweli Plantation)	Her husband is also a laborer of the estate. They have 3 children. Two of them are school leavers and seeking a job and one is still schooling. Has ¼ acre land for vegetable cultivation. They cultivate potatoes in January. 	They have requested to join the cluster program and they have been selected. She appreciates the cluster program since they have to spent the highest cost for the seed potato (SLRs. 18,000/- per 50kg of seed potato) and it is a high-risk investment. They have many bad experiences in low quality and low-yielding seed potatoes. The new program is highly appreciated. Road improvement is an additional benefit for them since it decreases the transportation cost of their yield to the market.
	R. Yamuna(32 Yrs., Female labor)	Lives with her parents and two brothers	Father is cultivating potatoes on about ¼ acre of land. They need 400kg of seed potato per season and its cost is about SLRs. 144,000. The return for the investment is low due to low-yielding varieties. There is a high risk in potato cultivation.
	W.B. Ekanayake (Farmer)	More than 30 years' experience in vegetable cultivation including potatoes. His family consists of a wife and 3 children. Lives in Keppetipola town. His farmland is located in Vidurapola GND and the extent of land is 3 acres (1.2ha).	He is one of the beneficiary farmers of the program. All the farmers in the area cultivate potatoes one time per year starting in January. Regular water supply is available throughout the year from Kande Ela (irrigation canal). Currently, all the farmers are in trouble due to the increase in agricultural inputs prices. The banning of agrochemicals heavily

			affected vegetable cultivation since there is no proper crop management methods are introduced. He has participated in the awareness program conducted by ASMP. He mentioned that the seed potato program will be a remarkable achievement of their farming activities since it includes all the crop management activities. Once they produce the seed potato in the January season, the yield will be transported and stored in the cool room that is proposed to construct in Rahangala Farm until the next cultivation season is start to distribute among the farmers.
	W.M. Gunasinghe (Farmer)	More than 25 years' experience in vegetable cultivation including potatoes. His family consists of a wife and 2 children. Lives in Keppetipola town. His farmland is located in Vidurapola GND and the extent of land is 3 acres (1.2ha). 	He is one of the beneficiary farmers. This season he has cultivated carrots in the farmland but the production cost is very high due to increases of the agrochemical by 40%. He hopefully waiting to start seed potato cultivation since it has integrated crop management practices with low application of agrochemicals. He has started the production of compost manure within his farmland to use during the next potato cultivation season.
	W.M. Ajith Kumara (Farmer)	More than 25 years' experience in vegetable cultivation including potatoes. His family consists of a wife and 2 children. Lives in	He is one of the beneficiary farmers identified for the cluster program. Currently, transportation time of the agricultural products from village to town is about 45-

		Wakkadahinna village of Keppetipola GND. He owns 0.5 acres (0.2ha) extent of farm land in Wakkadahinna. He works as a laborer when there is free time. 	minute s and charges high rates due to bad conditions of the road. If the road is improved up to better level the travel time will be reduced up to 15 minute and the cost will also be reduced subsequently. Highly appreciated the whole program.	

I. Environmental effects and mitigation measures

1. Screening of Potential Environmental Impacts

SN	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
1	Are there any asset(s) that would be affected or acquired due to proposed project interventions such as: Land, Physical structure (Dwelling or commercial), Fruit trees/crops, Community Resource Property etc.?		√		No disturbances to any existing land use, structures, crops, trees, or other resources
2	Is the sub-project area adjacent to (less than 500m) or goes through any of the following environmentally sensitive areas such as :Cultural heritage site, Protected area and/or of its buffer zone, Conservation forest, reserve or a sanctuary ,Mangrove, Estuarine, Wetland, including paddy fields, water bodies, PCRs, Landslide-prone areas etc.?		√		No such sensitive areas are located in the vicinity of the subproject area
3	Will the project activities involve with Encroachment on historical/cultural areas: disfiguration of landscape by road embankments, cuts, fills and quarries?		√		All the civil works and the cultivation activities pertaining to the subproject are limited to privately owned land only
4	Will the project interventions involve with encroachment on or impact ecologically sensitive or protected areas?		√		All the civil works and the cultivation activities pertaining to the subproject are limited to privately owned land only
5	Will the project interventions involve with alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?	√		Low	No heavy construction activities are going on. No excavation, cutting, or filling activities are proposed as civil works of the subproject

SN	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
6	Will the project interventions involve with deterioration of surface water quality due to silt runoff and sanitary wastes from work-based camps and chemicals used in construction?		√		No additional water usage amount other than what farmers utilize in other cropping cycles
7	Will the project intervention involve with Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?		√		No such activities are included as the subproject's activities
8	Will the project interventions involve with noise and vibration due to blasting and other civil works?		√		No blasting activities are required for the subproject
9	Is there any possibility to create poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations due project interventions?		√		No construction camps will be erected. Installation of sprinkle irrigation units and installation of poly tunnels and other related facilities in GOA's farm hence no need of erecting the labor camps
10	Will be possible to creation of temporary breeding habitats for mosquito vectors of disease?		√		No excavation activities or storage of construction material heavily are included as the civil works of the subproject. Hence no such impacts are anticipated
11	Will there be risk of accidents associated with the increased vehicular traffic due to project interventions?		√		No construction vehicles are required for the subproject. Material transportation is minimal
12	Will the project activities increase the risk of water pollution from oil, greases and fuel spills, and other materials?		√		No such pollution materials are generated as a result of the civil works of the subproject. No machinery or

SN	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
					construction vehicles are required for this subproject
13	Will the project activities involve with additional waste in water canals that may increase floods and waterlogs?		√		No wastewater is generated as a result of the subproject
14	Will the project activities involve with new/restored public areas/ spaces that can be inundated in case of floods?		√		Civil works of the subproject are limited to privately owned land only. Hence no such impacts are anticipated
15	Project interventions proposed to include Green infrastructure: Does sub-project include any of the following design aspects such as: Sri Lankan Guidelines of Green and Environmentally Friendly Building for the State Institutions (2016), Low energy materials, Reduced water use options, Energy optimization for lights, A/C etc. , Recycling and waste management, Increased human comfort, Enhanced landscaping, exterior or interior design, Site selection considering conservation of vegetation and wildlife?		√		Under this subproject, only install the poly tunnels with the accessories
16	Will the project interventions increase disaster Risk Management (DRM): such as: Floods, including coastal, Storm surges, Coastal erosion, Landslides, Land subsidence, Soil erosion and sedimentation, Rock falls, Cyclones, Droughts ,Earthquakes, Salinization, salinity intrusion into drinking water sources, Forest fires, High winds, tornadoes etc., Epidemic and hazards related to environmental pollution, Vector borne diseases?		√		No such impacts will be resulted by this subproject
17	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.?)		√		The proposed subproject's civil works will improve the existing activities and no additional processes or activities will be implemented under the subproject
18	Will the Project involve use, storage, transport, handling or production of substances or materials, which could be harmful to human health or		√		No such substances are involved with this subproject

SN	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
	the environment or raise concerns about actual or perceived risks to human health?				
19	Will the Project produce solid wastes during construction and/ or operation?		√		No solid waste is generated due to the subproject. But the crop residuals will be generated. The crop residuals will be burnt as agricultural practices to control the spreading of diseases and pests
20	Will the Project release pollutants or any hazardous, toxic or noxious substances to air?		√		No such emission will be released
21	Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?		√		No such impacts are anticipated as a result of the subproject implementation or operation
22	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?		√		No such impacts are anticipated
23	Will the project cause localized flooding and poor drainage during construction Is the project area located in a flooding location?		√		No flooding events will be created as a result of civil works of the subproject
24	Will there be any risks and vulnerabilities to public safety due to physical hazards during construction or operation of the Project?		√		No public will be contacted since the civil works are limited to privately owned land
25	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?		√		Civil works are very minor scale hence no such impacts will be resulted
26	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?		√		No public accesses will be disturbed by the subproject

SN	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
27	Are there any areas or features of high landscape or scenic value on or around the location, which could be affected by the project?		√		The project area has consisted of privately-owned cultivation land. Hence no such impacts will result.
28	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?		√		No such sensitive areas are located in the surrounding area, meantime such impacts will not result
29	Are there any areas on or around the location, which are used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, migration, which could be affected by the project?		√		No protected, important or sensitive species of flora and fauna are recorded within the subproject impact area
30	Is the project located in a previously undeveloped area, where there will be loss of green field land		√		For many decades, the land use of the area is agriculture
31	Will the project cause the removal of trees in the locality?		√		Tree removal is not required
32	Are there any areas or features of historic or cultural importance on or around the location, which could be affected by the project?		√		No cultural or historical monuments are reported within the subproject area
33	Are there existing land uses in 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?		√		The proposed civil works of the subproject will improve the existing agricultural activities. And no stranger activities are proposed under the project
34	Are there any areas in or around the location which are densely populated or built-up, which could be affected by the project?		√		The surrounding area is bounded by the cultivation land
35	Are there any areas in or around the location, which is occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities, which could be affected by the project?		√		The surrounding area of the subproject is bounded by the privately-owned cultivation lands

SN	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
36	Are there any areas in 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?		√		No impacts to the natural resources by the subproject
37	Are there any areas in 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 such pollutants are generated by the subproject

2. Environmental Management Plan

Contractor's Responsibility for Mitigating Adverse Environmental Issues

№	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 are 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 of	• 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 product and to assure the packing facility receives only clean and viable products

№	**Potential Environmental Impacts and Risk Level**	**Key project activities causing the impact**	**Mitigation Measures proposed and action to be implemented by the Contractor**
	product and high amount of waste	• Storing the harvested product before delivery to the drying facility • Discarding poor quality Potato and other waste organic materials in the field	• 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 of generated waste with care • Potential damages to the pipe system should be minimized by burying or covering the pipe distribution
5	Spreading of Invasive Alien Species	• Vegetation clearing • Cultivation of Potato	• Provide DOA certified potatoes 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 the 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	Deterioration of Water Quality due to erosion	• During land preparation	• Avoid silt being carried away to drainage and surface bodies • Establish mud traps at the entry of drainages • Regular cleaning of drainage system
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 providing personal protection equipment (PPEs). Provided 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

№	Potential Environmental Impacts and Risk Level	Key project activities causing the impact	Mitigation Measures proposed and action to be implemented by the Contractor
			• 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

3. Cost of mitigation

	Environmental mitigation measure	Cost (SLRs)	Remarks
1	Information Boards, leaflets (also on GRM)	100,000.00	Diversion of roads, Safety signage, awareness leaflets
2	Safety equipment (also to safeguard from COVID19)	75,000.00	Basic should include gloves, sanitizers, face shields, masks., washing facilities
3	On-site first aid facilities & hand washing stations	10,000.00	
4	Construction Erosion measures	25,000.00	

J. 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 place** 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
Improve the facilities at DOA's farm at Seetha Eliya and research center in Bandarawela	Vegetation loss, dust , Crop damage siltation	NS
Installation of sprinkler irrigation units and supplying other accessories to the beneficiary farmer	Vegetation loss, dust , Crop damage siltation	NS

K. EMP implementation responsibilities and cost

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 Agriculture 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.

L. Detail of person responsible for the environmental screening

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 nighttime work. Implementation of the Environmental Management Plan is sufficient to mitigate the identified impacts.

M. Details of Persons Responsible for the Environmental Screening

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

N. Annexes

1. Field Environmental Screening Checklist

<table>
<tr><th>No</th><th>Item</th><th>Details</th></tr>
<tr><td colspan="3">Introduction</td></tr>
<tr><td>1</td><td>Name of the Site</td><td>Seed potato production under a controlled environment- under Controlled Environment in Poly Tunnel System and Good Agriculture Practices at Wakkadahinna in Keppettipola and Vidurapola GNDs in Welimada DSD in Badulla District</td></tr>
<tr><td>2</td><td>Province</td><td>Uva</td></tr>
<tr><td>3</td><td>District</td><td>Badulla</td></tr>
<tr><td>4</td><td>Divisional Secretary Division</td><td>Welimada</td></tr>
<tr><td>5</td><td>Local Authority</td><td>Keppetipola</td></tr>
<tr><td>6</td><td>Grama Niladari Division (s)</td><td>Keppetipola and Vidurapola</td></tr>
<tr><td>7</td><td>Brief description of the project (Be as brief as possible, confining to main elements only, provide a 1:10,000 scaled site map inclusive of area within 500m radius from the project site)</td><td>Potato seed production under controlled environment- n Poly Tunnel System and Good Agriculture Practices at Keppattipola and Boralanda in Welimada DSDs in Badulla, District belongs to Uva province. These crops will be introduced by the Department of Agriculture (DOA) as a pilot project in the selected areas and it will be good alternative crops for farmers to get maximum output from their uplands. The project assists to enhance the seed potato production by providing Expansion of existing G0 production unit at Seetha Eliya Government farm to produce G0 & G1 seed requirement for seed producer associations, Increase seed production by small & medium scale seed producers, Improve Quality of Self Seed produced by farmers, 2 Cold Storage facilities for seed producer organizations and Packaging material and labeling for seed potato (promotional samples).

Google Map- Attached Annex 02
N: $6^0$53’35.29”
E: $80^0$51’18.83”</td></tr>
<tr><td>8</td><td>Does the site /project require any;</td><td>
<table>
<tr><th></th><th>Yes</th><th>No</th><th>If yes give the extent (in ha)</th></tr>
<tr><td>Reclamation of land, wetlands</td><td></td><td>X</td><td></td></tr>
<tr><td>Clearing of forest</td><td></td><td>X</td><td></td></tr>
</table>
</td></tr>
<tr><td>9</td><td>Distance from Coast line</td><td>Approximately more than 100km from the both eastern and western coastal line</td></tr>
<tr><td>10</td><td>Minimum land area required for the proposed development (based on urban guidelines) (ha</td><td>The total extent of the proposed development area is two 2000 square feet poly tunnel. The development area Completely belongs to the Seethaeliya potato research center and compliance with urban development guidelines is not necessary due to no construction will be anticipated by this project intervention. The project interventions will be limited to the farmlands owned by the farmers in the area.</td></tr>
<tr><td>11</td><td>Available total land area within the identified location (ha)</td><td>Potato seed production under a controlled environment- Keppetipola and Vidurapola in Poly Tunnel System (2000 square feet) and Good Agriculture Practices at Welimada DSD in Badulla, District</td></tr>
</table>

12	Expected construction period	06 Months
13	Responsible contact person with contact Information	Deputy Project Director (Uva Province). Agriculture Modernization Project (ASMP), Siyambalanduwa Road, Monaragala. 0777512013 Email-updpdasmp@hotmail.com , Web www.asmp.lk
14	Present Land Ownership	State | | Private | X | Other (specify) | | Project will be implemented in the farm lands owned by farmers in the selected area.
15	Total Cost of the Project	SLRs 147.23MM
16	Anticipated Date of Completion	April 2022
17	Beneficiaries of the Project	More than 340 farmers will be benefitted to bring their crops by using this improved road to the marketing. However, initially about 120 farmers will be engaged in.
DESCRIPTION OF THE ENVIRONMENT		
PHYSICAL		
18	Topography & Landforms (map)	Annex 02
19	Relief (difference in elevation)	Low <20m | | Medium 20-40m | | High 40-60m | X | >60m | | Geologically, the project area belongs to the highland Complex of Sri Lanka.
20	Slope	Low <30% | | Medium 30-40 % | | High 40-60% | X | Very High > 60% | | Generally the project site is an undulating terrain with a gentle slope (high slope 40-60%)
21	Position on Slope	Bottom | | Mid-slope | | Upper- Slope | X | The elevation of project site is around 1200m AMSL
22	Soil type	Red Yellow Podzolic type and Mountain Regosols type
23	Depth of top soil	Shallow <20cm | | Moderate 20-100cm | | Deep >100cm | X |
24	Soil Erosion	Low | | Medium | | High | X | Generally the land are hilly and slope higher 40-60%
25	Climate	Wet Zone | x | Intermediate Zone | | Dry Zone/ Semi-Arid Zone | | Average temperature is 18.9 ºC and maximum and minimum are 22.0°C and 15.0°C respectively. The average annual rainfall varies from 1,750mm to 2,500 mm and average 2,000mm. Relative Humidity varies from 75% during the day to 95% at night.
26	Annual dry period	October - February
27	Source of fresh Surface Water	Spring/canal | x | Tank/Reservoir | x | | Perennial Stream | | Seasonal Stream | | None | | Kande Ela Canal provides water for irrigation from Kande Ela tank
28	Surface Water Use	Domestic | x | Washing/Bathing | x | Irrigation | x | Animal use | |
29	Surface Water Quality	Poor | | Moderate | | Good | X |
30	Ground Water Availability	Dug Well | | Tube Well | | Other (Specify) | | No ground water use. Ground water levels will be very deep

31	Ground Water Use	Domestic ☐ Washing/Bathing ☐ Irrigation ☐ Animal use ☐ Not applicable
32	Ground Water Quality	Poor ☐ Moderate ☐ Good ☐ Not Applicable
33	Incidence of Natural Disasters	Floods ☐ Prolonged droughts ☐ Cyclones/tidal waves ☐ Other ☐ No any disaster records
34	Geological Hazards	Landslides X ☐ Rock falls X ☐ Subsidence ☐ Other ☐ The area is under landslide prone area as per the Soil Conservation Act

Ecological

35	Habitat Types in the Project Site (indicate the % of each habitat type)	Natural Forest-0% / Degraded Forest-0% / Natural Scrubland-0% / Degraded Scrubland-0% / Riverine forest-0% Grassland-0% / Abandoned agricultural land-0% / Marsh-0% / Lagoon-0% / Estuary-0% Coastal Scrub-0% / Mangrove-0% / Salt marsh-0% / Home-gardens-0% / Cart track with scrubs-100% **Vegetation of the project site-** Proposed Improvement area already functioning as community pond for the micro-irrigation. No considerable habitats were found within the proposed cultivation area other than the grass bushes with Ginigrass, Nidikummba, Pine, Goraka, Heen Iraminia, and Lantana**.** **Fauna of the site-** Very few numbers of domesticated (Buffalo, Cats, and Dogs) and very common taxonomical group species such as Monkeys, Lizards, Frogs, Butterflies were recorded during the rapid study. In addition, there are possibilities of the wild bow, etc. in these plantations
36	Habitat types within 500m radius from the site periphery (indicate the % of each habitat type)	Natural Forest-0% / Degraded Forest-0% / Natural Scrubland-0% / Degraded Scrubland-0% / Riverine forest-0% Grassland-0% / Abandoned agricultural land-10% / Marsh-0% / Lagoon-0% / Estuary-0% Coastal Scrub-0% / Mangrove-0% / Salt marsh / Home-Gardens-40% / Other field crops and highland-50% Within a radius of 500m from the proposed site, predominantly Tea Plantation and few vegetable cultivation areas can be seen.
37	Are there any environmentally and Culturally sensitive areas within 250m?	Protected Areas ☐ Migratory pathways of animals ☐ Archeological sites ☐ Wetlands ☐ Mangroves strands ☐ No environmentally and cultural sensitive areas within 250m radius from the proposed development site.

38	**Screening Questions**	**Yes**	**No**	**Scale of Impact**			**Remarks**
A	**Siting of the activity**			**High**	**Moderate**	**Low**	
a.	Are there any environmentally and Culturally sensitive areas within the project site and		x				

	500 meters from the project boundary?						
b.	Protected Areas / Forest Reserve		X				
c.	Migratory pathways of animals		X				
d.	Archeological sites		X				
e.	Wetlands		X				
f.	Mangroves strands		X				
g.	Estuarine		X				
h.	Buffer zone of PAs/FRs		X				
i.	Special area for protecting Biodiversity		X				
j.	Are there any plants (endemic and threatened species) of conservation importance within the project site and 500 meters from the project boundary?		X				Not recorded
k.	Are there any animals (endemic and threatened species) of conservation importance within the project site and 500 meters from the project boundary?		X				Not recorded
B	**Potential Environmental Impacts** **Will the activity / sub-project cause**						
a.	Land disturbance or site clearance?	X					But the proposed land areas are already been cleared and cultivated
b.	Negative effects on rare (vulnerable), threatened or endangered species of flora or fauna or their habitat?		X				
c.	Negative effects on designated wetlands?		X				
d.	Spread of invasive plants or animals?		X				
e.	Negative effects on wildlife habitat, populations, corridors or movement?		X				
f.	Destruction of trees and vegetation?		X				
g.	Impact on fish migration and navigation?		X				

h.	Obstruction of natural connection between river and wetlands inside project area or natural drainage system?		X				
i.	Water logging due to inadequate drainage?		X				
j.	Insufficient drainage leading to salinity intrusion?		X				
k.	Negative effects on surface water quality, quantities or flow?		X				
l.	Negative effects on groundwater quality, quantity or movement?		X				
m.	Increased demand of water requirements leading to reduction of water supply for competing uses?		X				
n.	Increase probability of spread of diseases and parasites?		X				
o.	Significant sedimentation or soil erosion or shoreline or riverbank erosion on or off site?		X				
p.	Loss of existing buildings, property, economic livelihood?		x				
q.	Negative impact on soil stability and compactness?		X				
r.	Impacts on sustainability of associated construction waste disposal?		X				
s.	Changes to the land due to material extraction?		X				
t.	Traffic disturbances due to construction material transport and wastes?		x				
u.	Increased noise due to transportation of equipment and construction materials?		x				
v.	Increased noise due to day-to-day construction activities?		x				

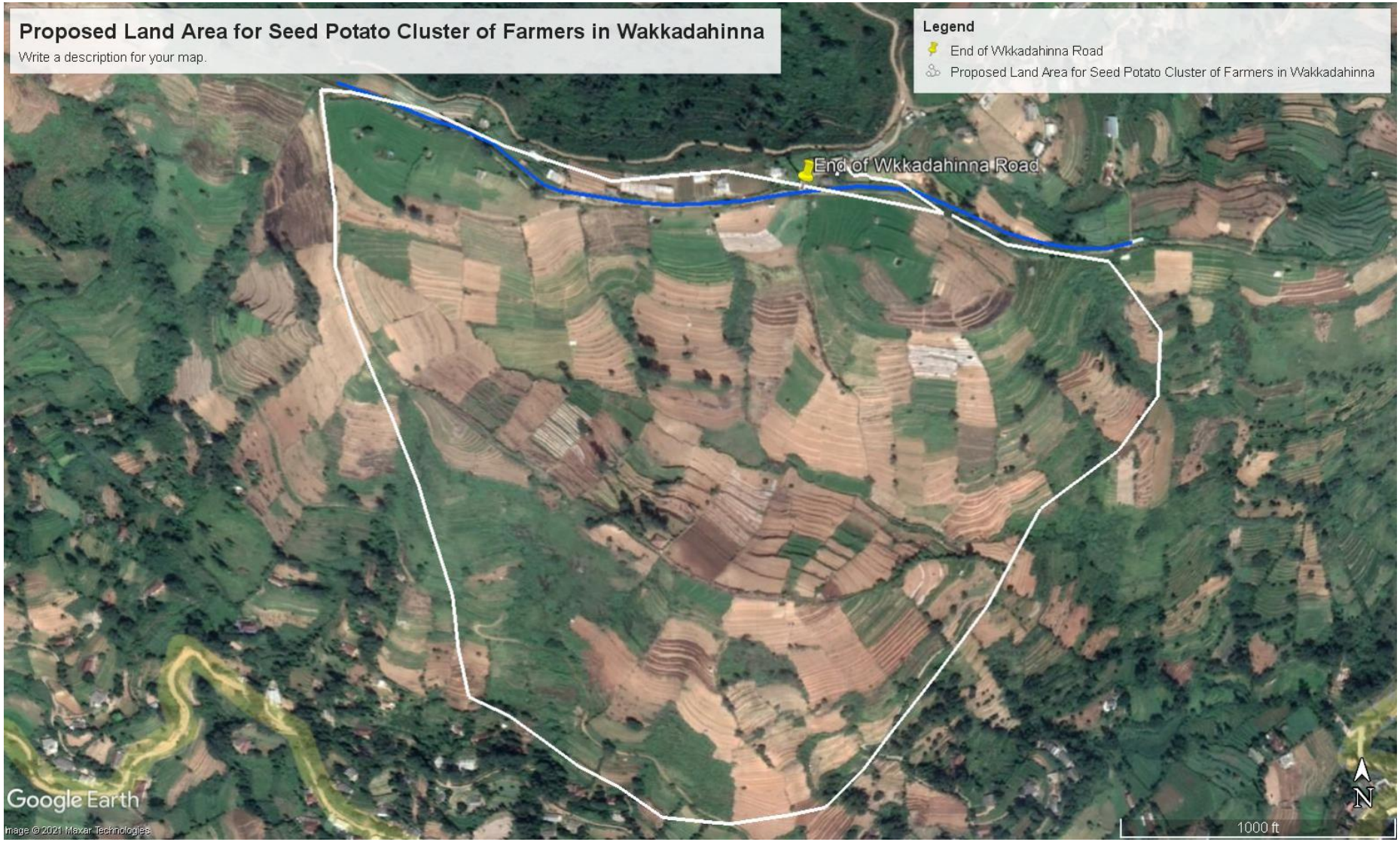
w.	Increased wind-blown dust from material (e.g. fine aggregate) storage areas?		x				
x.	Degradation or disturbance of historical or culturally important sites?		X				
y.	Health and safety issues?		x				
	Will the activity / sub-project require						
a.	Setting up of ancillary production Facilities		X				
b.	Significant demands on utilities and services?		X				
c.	Accommodation or service amenities to support the workforce during construction		x				

CONTACT DETAILS OF OFFICIALS AND RECOMMENDATIONS		
39	Name of the officer completed the form (From the Developer)	Mr.D.M. S. Bandara
40	Designation and contact Information	Environmental and Social Safeguards Specialist
41	List of team members	N/A
42	Overall observation and Recommendation	Impacts are identified during the environmental screening are not significant and limited to the cultivation phase of the proposed project. The impacts could be mitigated by implementing the EMP given below.
43	Signature and date	

43. FINAL OBSERVATIONS & RECOMMENDATIONS			
A	Does this site require an Initial Environmental Examination/Environmental Impact Assessment (IEE/EIA) or any other Environmental Assessments (EA) under the national regulations and please state the reasons?	No	The impacts that are anticipated during the environmental screening are not significant and low in magnitude considering the scale of rehabilitation work anticipated by the proposed activity and limited to the construction phase.
B	Although national regulations may not require IEE/EIA at this Site, are there environmental issues which need to be addressed through further environmental investigations and/or EA	Yes	During the cultivation phase the Information disclosure and Grievance Readdressed Mechanism (GRM), construction material transport, solid waste, and pollution impact to be mitigated by addressing the Best Agricultural Techniques practices implemented by recommendation suggested by the EMP below.

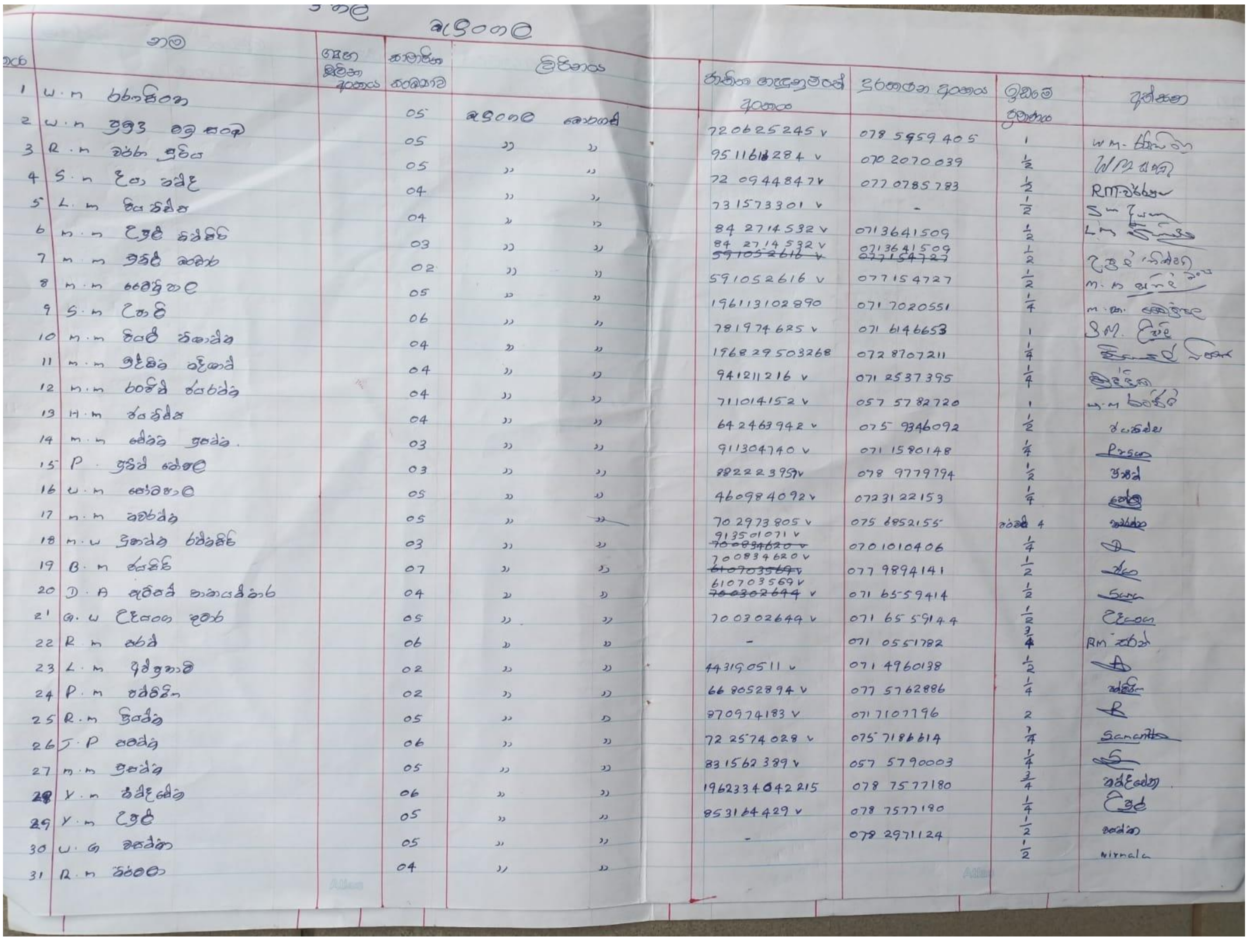
	based on the guidance provided in EAMF? If the answer is "Yes" briefly describe the issues and type of investigations that need to be undertaken.		
C	Will this site be abandoned based on the current observations? If yes, please state the reasons.	Yes	Farming in the area is abandoned due to the lack of water supply in the area.
D	Does the proposed site meet the national urban planning requirements (only applicable for activities outside PAs)? If the answer is "No", what needs to be done to meet these requirements; if the answer is "Yes", has the project site obtained the necessary approvals?	No	
E	In addition to the above issues, please indicate any additional observations, recommendations if any	N/A	

2. Google Map/ Location Map



Source: Google Map

3. List of Beneficiaries



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26	J.P [illegible]	06	722574028 V	075 7186614	1/4	Samantha
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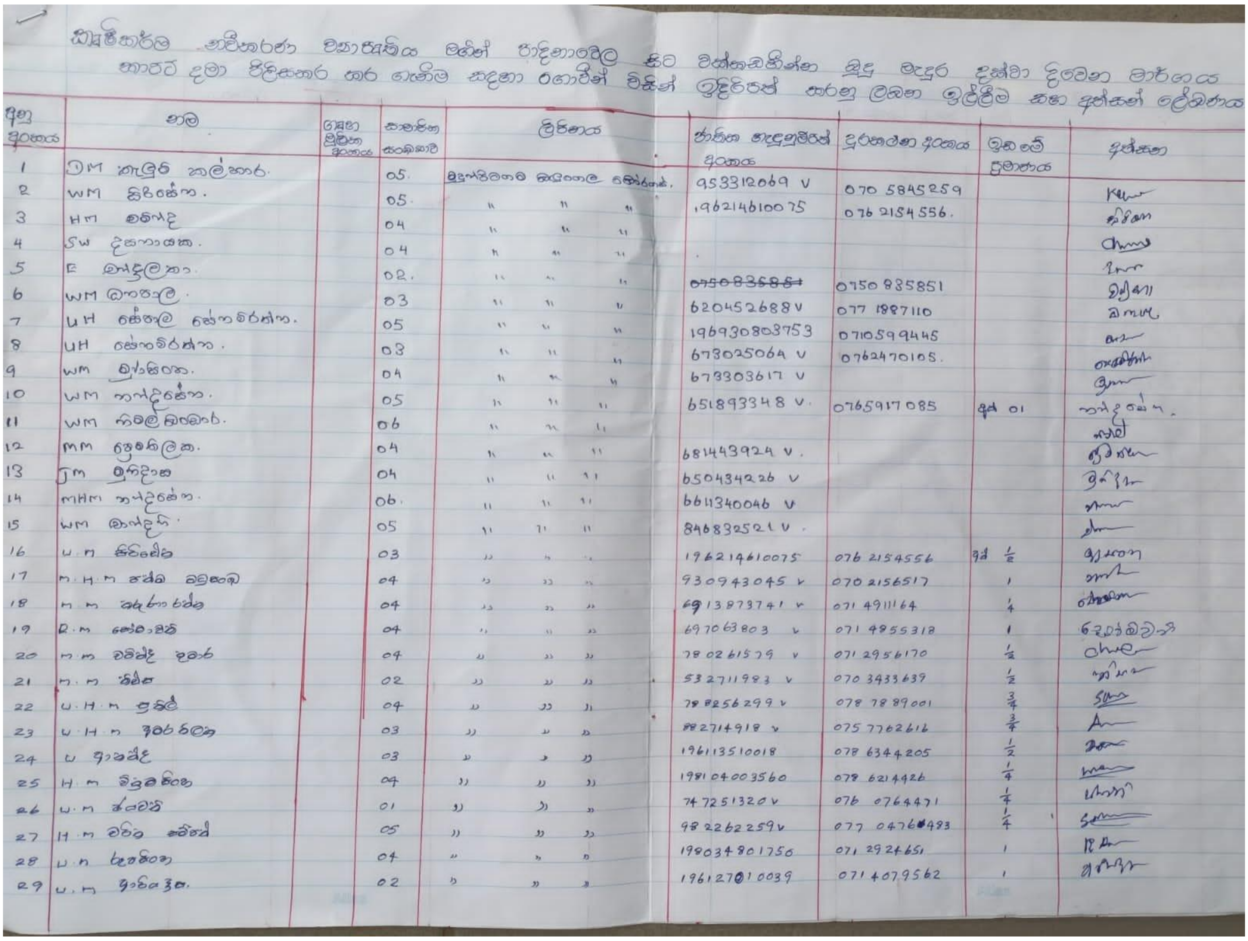

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අනු අංකය	නම	ගෘහ මූලික අංකය	සාමාජික සංඛ්‍යාව	ලිපිනය	ජාතික හැඳුනුම්පත් අංකය	දුරකථන අංකය	ඉඩමේ ප්‍රමාණය	අත්සන
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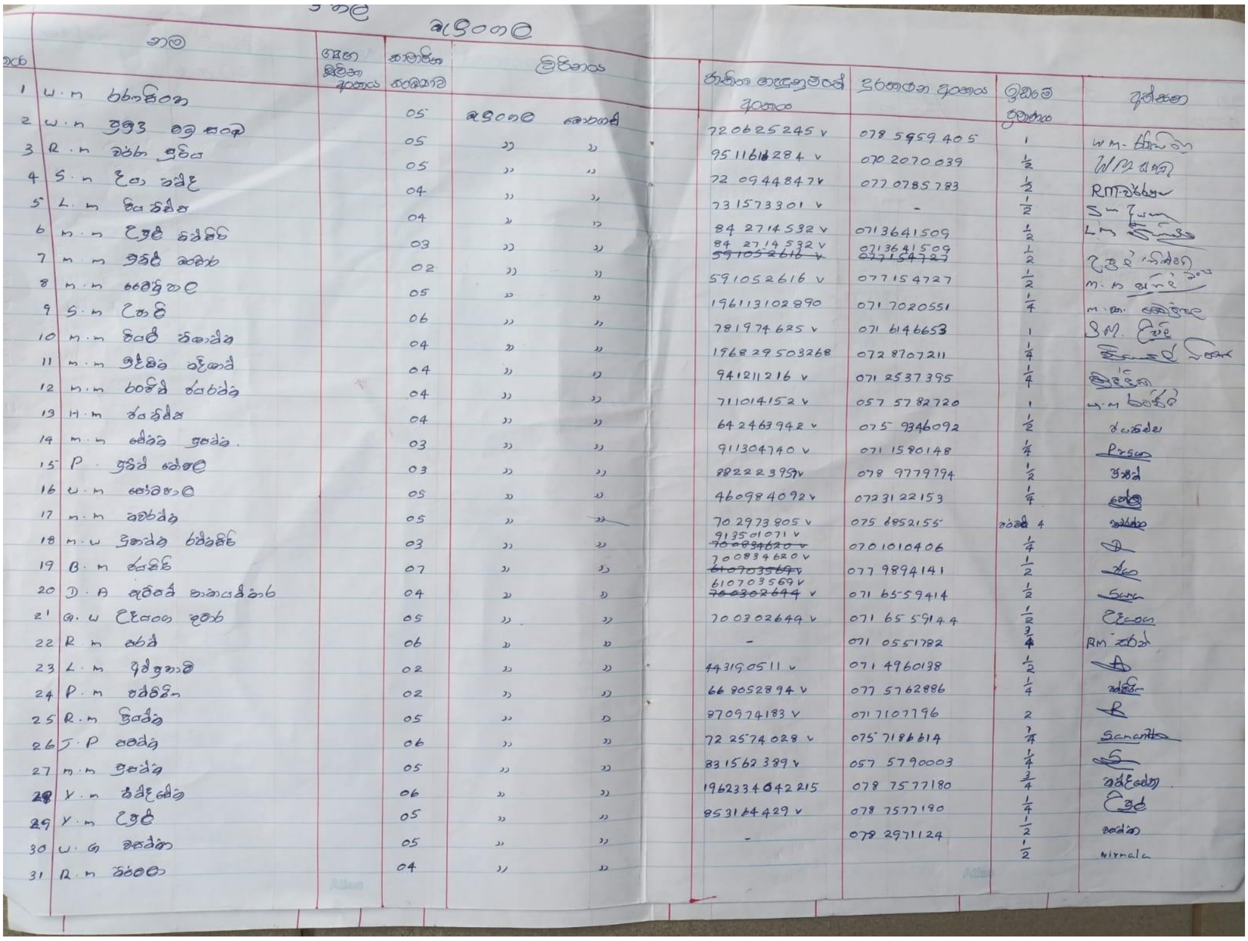
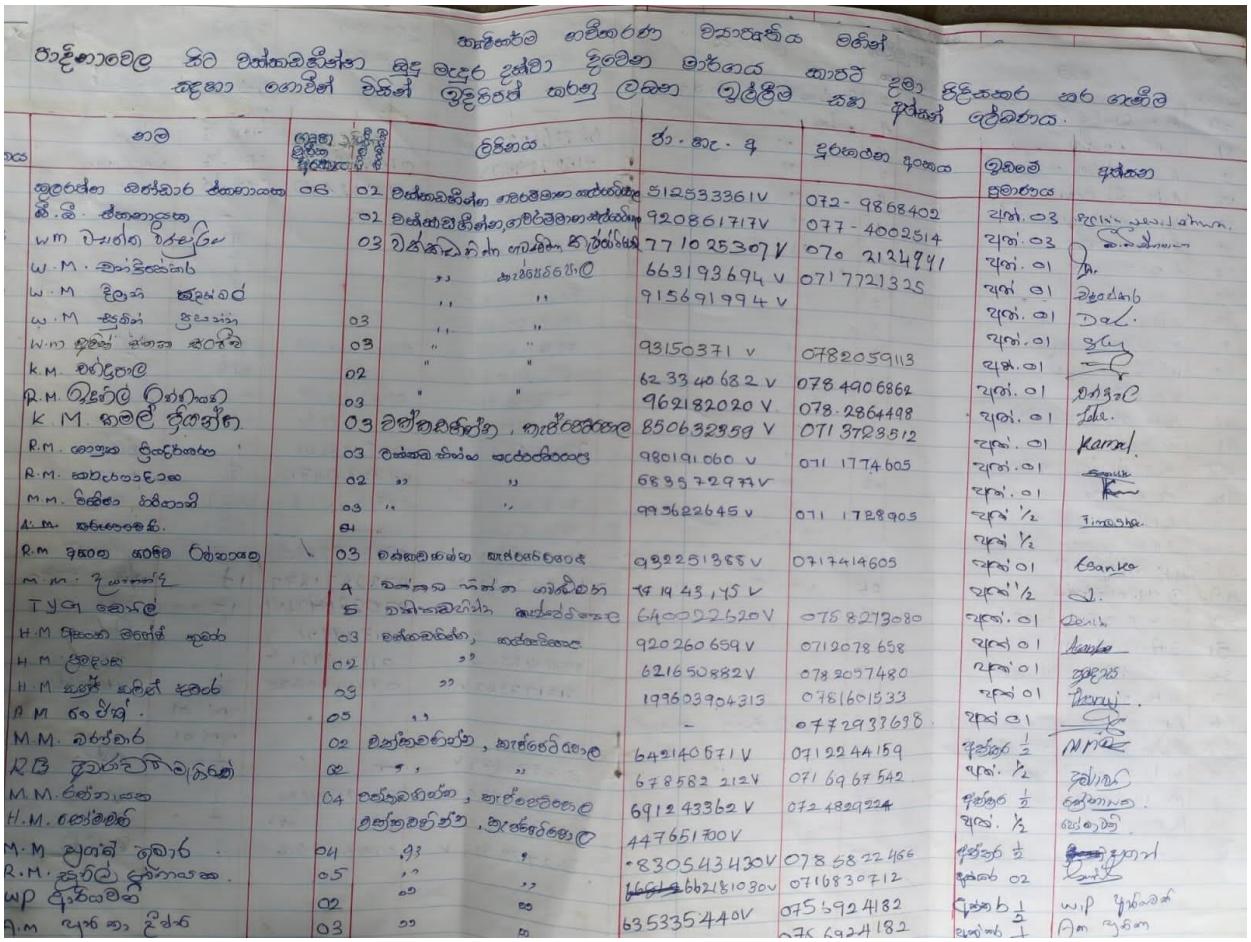
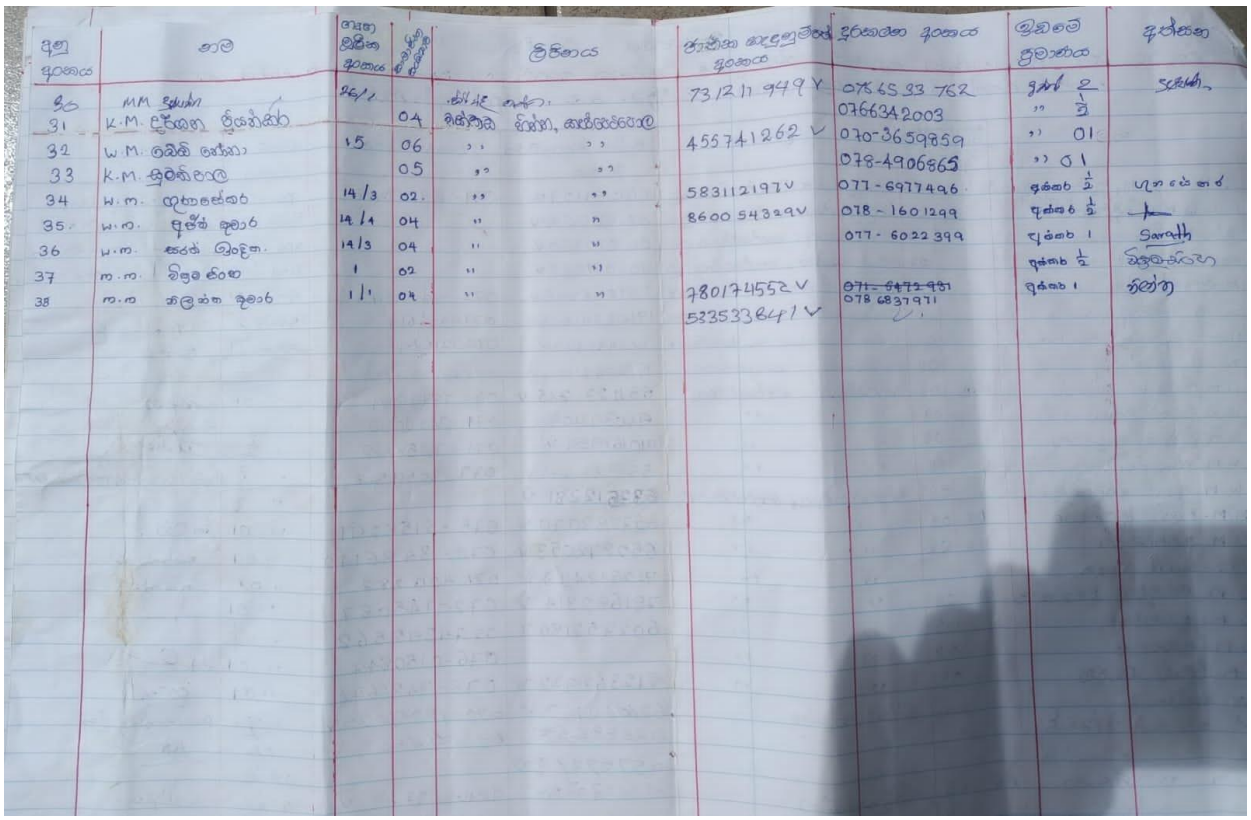
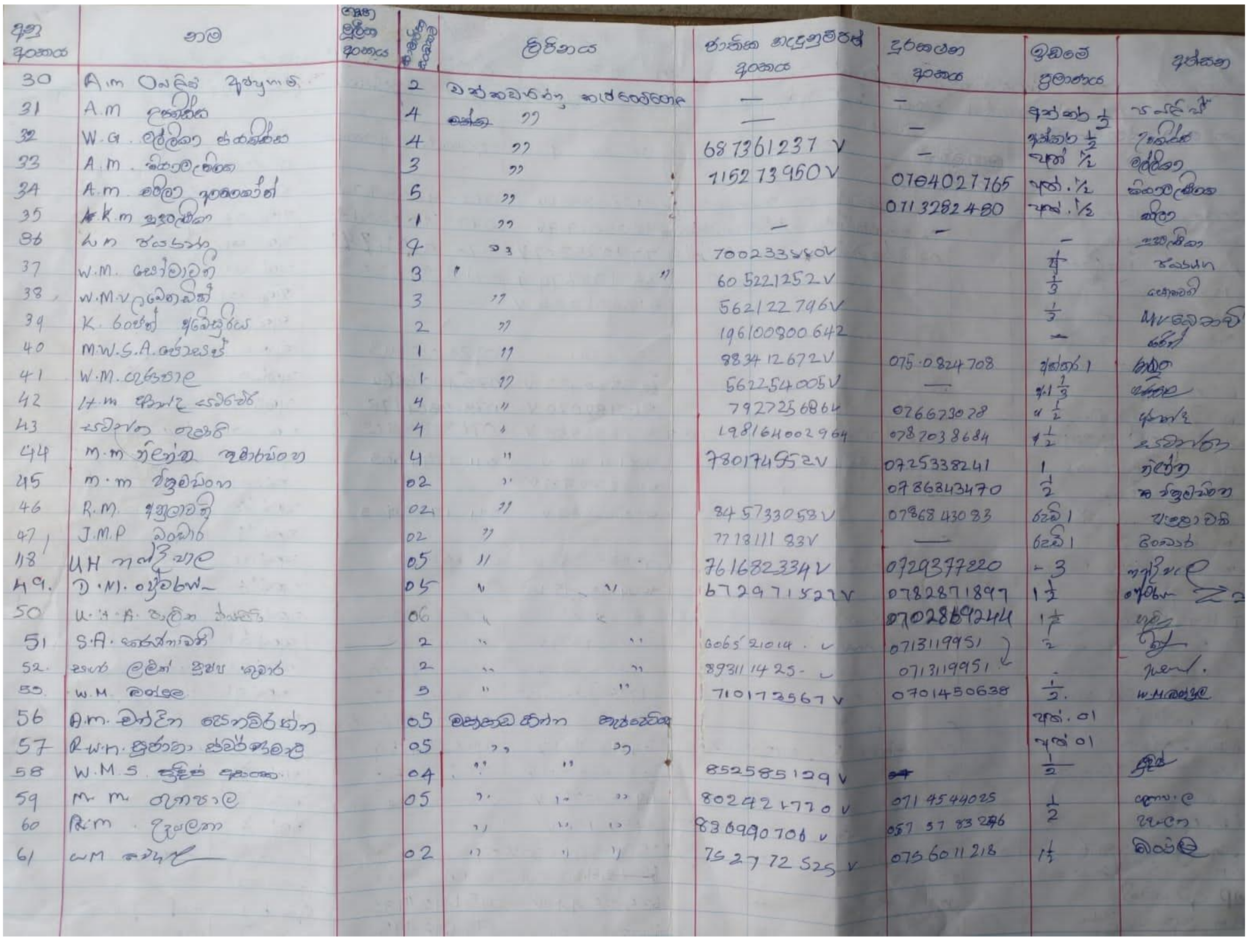
15	WM [illegible]		05	" " "	846832521 V.			
16	U.M [illegible]		03	" " "	196214610075	076 2154556	[illegible] 1/2	
17	M.H.M [illegible]		04	" " "	930943045 V	070 2156517	1	
18	M.M [illegible]		04	" " "	6913873741 V	071 4911164	1/4	
19	R.M [illegible]		04	" " "	697063803 V	071 4855318	1	
20	M.M [illegible]		04	" " "	780261579 V	071 2956170	1/2	
21	M.M [illegible]		02	" " "	532711983 V	070 3433639	1/2	
22	U.H.M [illegible]		04	" " "	788256299 V	078 7889001	3/4	
23	U.H.M [illegible]		03	" " "	882714918 V	075 7762616	3/4	
24	U [illegible]		03	" " "	196113510018	078 6344205	1/2	
25	H.M [illegible]		04	" " "	198104003560	078 6214426	1/4	
26	U.M [illegible]		01	" " "	747251320 V	076 0764471	1/4	
27	H.M [illegible]		05	" " "	982262259 V	077 04760483	1/4	
28	U.M [illegible]		04	" " "	198034801750	071 2924651	1	
29	U.M [illegible]		02	" " "	196127010039	071 4079562	1	



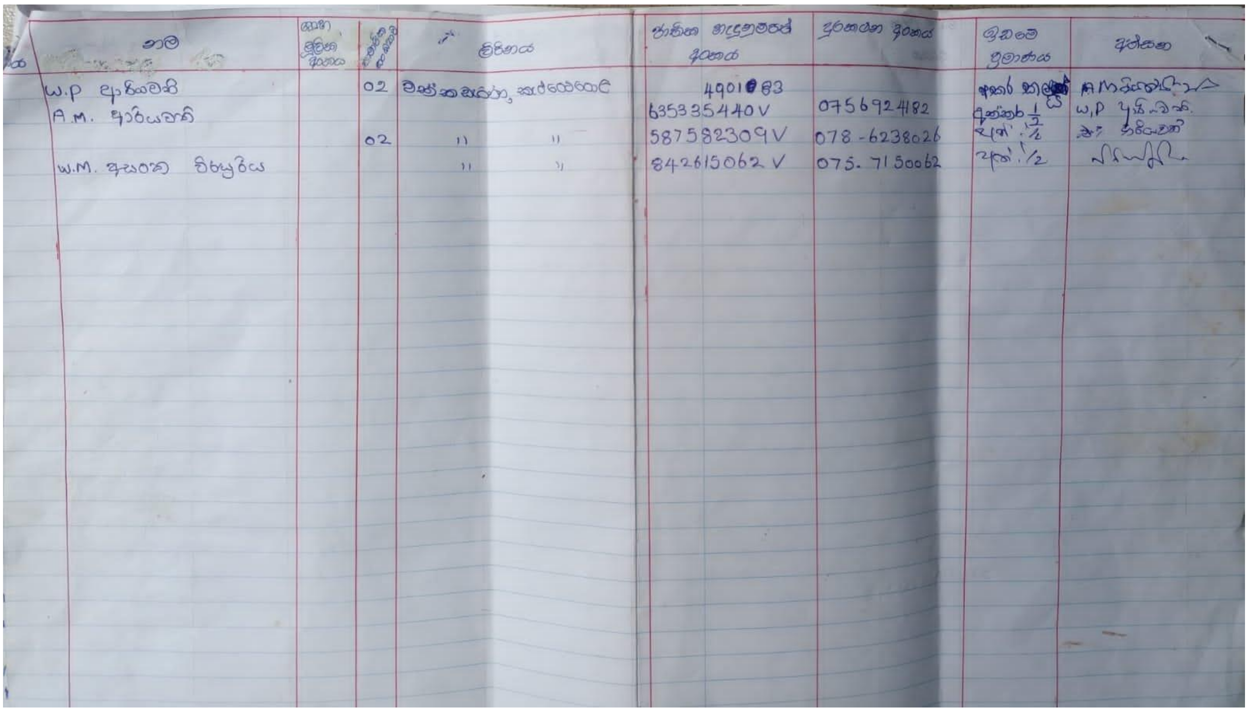
අනු අංකය	නම	ගෘහ මූලික අංකය	සාමාජික සංඛ්‍යාව	ලිපිනය	ජාතික හැඳුනුම්පත් අංකය	දුරකථන අංකය	ඉඩමේ ප්‍රමාණය	අත්සන
1	U.M [illegible]		05	[illegible]	720625245 V	078 5959405	1	
2	U.M [illegible]		05	" "	951161284 V	070 2070039	1/2	
3	R.M [illegible]		05	" "	720944847 V	077 0785783	1/2	
4	S.M [illegible]		04	" "	731573301 V	-	1/2	
5	L.M [illegible]		04	" "	84 2714532 V	0713641509	1/2	
6	M.M [illegible]		03	" "	84 2714532 V ~~591052616 V~~	0713641509 ~~077154727~~	1/2	
7	M.M [illegible]		02	" "	591052616 V	077154727	1/2	
8	M.M [illegible]		05	" "	196113102890	071 7020551	1/4	
9	S.M [illegible]		06	" "	781974625 V	071 6146653	1	
10	M.M [illegible]		04	" "	196829503268	072 8707211	1/4	
11	M.M [illegible]		04	" "	941211216 V	071 2537395	1/4	
12	M.M [illegible]		04	" "	711014152 V	057 5782720	1	
13	H.M [illegible]		04	" "	642463942 V	075 9346092	1/2	
14	M.M [illegible]		03	" "	911304740 V	071 1580148	1/4	
15	P [illegible]		03	" "	882223959 V	078 9779794	1/2	
16	U.M [illegible]		05	" "	460984092 V	0723122153	1/4	
17	M.M [illegible]		05	" "	702973805 V	075 6852155	[illegible] 4	
18	M.W [illegible]		03	" "	913501071 V ~~700834620 V~~	0701010406	1/4	
19	B.M [illegible]		07	" "	700834620 V ~~610703569 V~~	077 9894141	1/2	
20	D.A [illegible]		04	" "	610703569 V ~~700302644 V~~	071 6559414	1/2	
21	G.W [illegible]		05	" "	700302644 V	071 6559144	1/2	
22	R.M [illegible]		06	" "	-	071 0551782	3/4	
23	L.M [illegible]		02	" "	443190511 V	071 4960138	1/2	
24	P.M [illegible]		02	" "	668052894 V	077 5762886	1/4	
25	R.M [illegible]		05	" "	870974183 V	071 7107796	2	
26	J.P [illegible]		06	" "	722574028 V	075 7186614	3/4	
27	M.M [illegible]		05	" "	831562389 V	057 5790003	1/4	
28	Y.M [illegible]		06	" "	196233404215	078 7577180	3/4	
29	Y.M [illegible]		05	" "	853164429 V	078 7577190	1/4	
30	U.G [illegible]		05	" "	-	078 2971124	1/2	
31	R.M [illegible]		04	" "			1/2	







අනු අංකය	නම	ගොවි ලියාපදිංචි අංකය	පවුලේ සාමාජික සංඛ්‍යාව	ලිපිනය	ජාතික හැඳුනුම්පත් අංකය	දුරකථන අංකය	ඉඩමේ ප්‍රමාණය	අත්සන
30	A.m [illegible]		2	[illegible]	—	—		[illegible]
31	A.m [illegible]		4	[illegible] "	—	—	අක්කර $\frac{1}{2}$	[illegible]
32	W.G. [illegible]		4	"	687361237 V	—	අක්කර $\frac{1}{2}$	[illegible]
33	A.m. [illegible]		3	"	715273950V	—	අක් ½	[illegible]
34	A.m. [illegible]		5	"		0704027765	අක්. ½	[illegible]
35	K.m [illegible]		1	"		0713282480	අක්. ½	[illegible]
36	[illegible]		4	"	—	—	—	[illegible]
37	W.M. [illegible]		3	"	700233380V		$\frac{1}{4}$	[illegible]
38	W.M.V [illegible]		3	"	605221252V		$\frac{1}{3}$	[illegible]
39	K. [illegible]		2	"	562122746V		$\frac{1}{3}$	[illegible]
40	M.W.S.A. [illegible]		1	"	196100800642		—	[illegible]
41	W.M. [illegible]		1	"	883412672V	075 0824708	අක්කර 1	[illegible]
42	H.m [illegible]		4	"	562254005V	—	අ.1 $\frac{1}{3}$	[illegible]
43	[illegible]		4	"	792725686V	0766730728	" $\frac{1}{2}$	[illegible]
44	M.m [illegible]		4	"	198164002964	0787038684	" $\frac{1}{2}$	[illegible]
45	M.m [illegible]		02	"	780174552V	0725338241	1	[illegible]
46	R.M. [illegible]		02	"		0786843470	$\frac{1}{2}$	[illegible]
47	J.M.P [illegible]		02	"	845733058V	07868 43083	[illegible] 1	[illegible]
48	UH [illegible]		05	"	771811183V	—	[illegible] 1	[illegible]
49.	D.M. [illegible]		05	" "	761682334V	0729377220	- 3	[illegible]
50	U.H.A. [illegible]		06	" "	672971527V	0782871897	1 $\frac{1}{2}$	[illegible]
51	S.A. [illegible]		2	" "		0702869244	1 $\frac{1}{2}$	[illegible]
52.	[illegible]		2	" "	6065 21014 V	0713119951	$\frac{1}{2}$	[illegible]
53.	W.M. [illegible]		5	" "	89311425 V	0713119951		[illegible]
56	A.m. [illegible]		05	[illegible]	710173567V	0701450638	$\frac{1}{2}$.	W.M. [illegible]
57	R.W.M. [illegible]		05	" "			අක්. 01	
58	W.M.S. [illegible]		04	" "			අක් 01	
59	M. m. [illegible]		05	" " "	852585129V	[illegible]	$\frac{1}{2}$	[illegible]
60	R.m [illegible]			" " "	802421770V	071 4544025	$\frac{1}{2}$	[illegible]
61	W.M [illegible]		02	" " "	836990706 V	057 37 83 296		[illegible]
					752772525 V	075 6011218	1 $\frac{1}{2}$	[illegible]



	නම	ගොවි ලියාපදිංචි අංකය	පවුලේ සාමාජික සංඛ්‍යාව	ලිපිනය	ජාතික හැඳුනුම්පත් අංකය	දුරකථන අංකය	ඉඩමේ ප්‍රමාණය	අත්සන
	W.P [illegible]		02	[illegible]	4901083		අක්කර [illegible]	A.M. [illegible]
	A.M. [illegible]				635335440V	0756924182	අක්කර $\frac{1}{2}$	W.P [illegible]
			02	" "	587582309V	078-6238026	අක් ½	[illegible]
	W.M. [illegible]			" "	842615062 V	075-7150062	අක් ½	[illegible]