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Agriculture Modernization Project

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Ministry of Agriculture
கமத்தொழில் அமைச்சு

Environmental Screening Report

Strengthening Capacity to Enhance Planting Material Production of Vegetables- Purchasing of Land Vehicles, Rehabilitation of Cold Storage Facility and Strengthening Seed Processing Facility at HORDI, and Dodangolla

Project Management Unit
Agriculture Sector Modernization Project
January 2022

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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

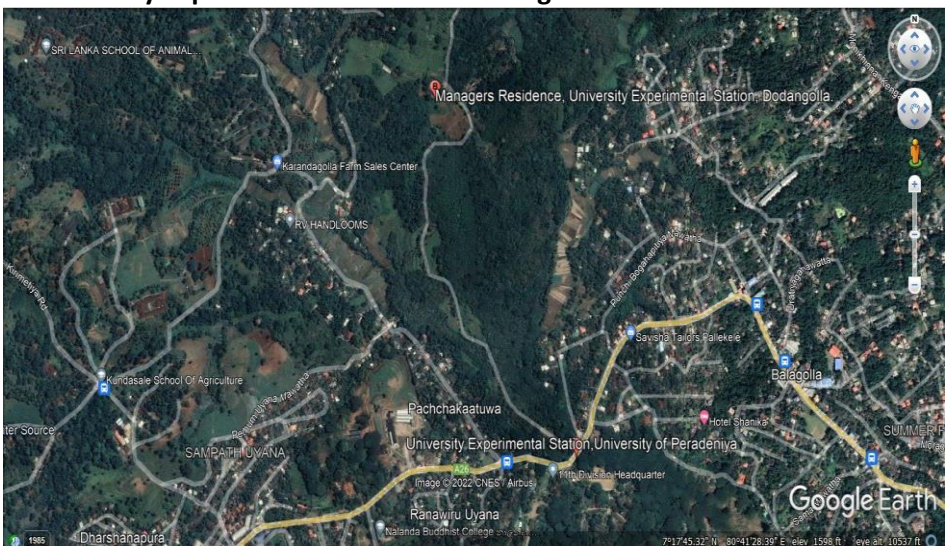
ENVIRONMENTAL SCREENING REPORT (ESR)

A. THE PROJECT IDENTIFICATION

Project Title	Strengthening Capacity to Enhance Planting Material Production of Vegetables- Purchasing of Land Vehicles, Rehabilitation of Cold Storage Facility and Strengthening Seed Processing Facility at HORDI, and Dodangolla
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 impacts, and environmental condition of the subproject area, and stakeholder consultations and concerns on subproject identification, designing, and implementation, the implementation plan of the viable mitigation measures against the identified environmental impacts.

B. PROJECT LOCATION

Location	The subproject's activities will be mainly implemented in 2 different locations. They are; 1. Horticultural Crops Research and Development Institute (HORDI) at Gannoruwa- The institute is located at Gannoruwa 8 km away from Kandy city in Yatinuwra DS division of Kandy district in Central Province. 2. University Experimental Station at Dodangolla, Kundasale- University experimental station is located at Dadangolla 11.7km away from Kandy city in Kundasale DS division of Kandy district in Central Province Under this subproject, supplying land vehicles for HORDI and university experimental station, rehabilitation of existing cool storage and seed processing facilities will be implemented for strengthening the research and seed production facilities of the stations. The location maps are annexed as Annex 1.

Location (Google Map) 1. HORDI @ Gannoruwa $7^0$16'25.70" N $80^0$36'08.89" E 2. University Experimental Station @ Dodangolla $7^0$17'07.21" N $80^0$42'28.24" E	**1. Horticultural Crops Research Development Institute (HORDI)- Gannoruwa**  **Figure 1: Location of HORDI @ Gannoruwa** **2. University Experimental Station at Dodangolla**  Figure 2: Location of University Experimental Station @ Dodangolla
Definition of Project Area *(The geographical extent of the project & areas affected during construction)*	**<u>1. Horticultural Crops Research and Development Institute (HORDI)</u>** The Horticultural Crop Research and Development Institute (HORDI) is vested with the responsibility of technology development concerning vegetables, root and tuber crops and floriculture. The research program focuses on the development of improved crop varieties, new propagation methods, post-harvest and food processing methods, the use of protected culture and ensuring better plant health with fewer defendants on chemicals. It is situated at Gannoruwa Peradeniya, coordinating the network of RARDCS, ARSS and horticultural farms. ***<u>History of HORDI</u>*** The Department of Agriculture was established in 1912 and the Division of Research was one of its important sections that provide scientific information for establishment of major plantation crops, tea, rubber coconut and other plants of economic and ornamental importance.

Three separate institutions for tea, rubber and coconut were established and thereafter the Division of Research in the Department of agriculture placed the emphasis on peasant agriculture and established the Central Agricultural Research Institute.

The foundation stone for new laboratories of the Central Agricultural Research Institute was laid in Gannoruwa on 21 June 1958 by the Honorable S.W.R.D Bandranayake. Honorable Dudley Senanayaka, late Prime Minister of Ceylon, formally declared the Institute open on 6th August 1967. Apart from the administrative Headquarters housed in the institute, there were Research divisions of Agricultural Botany, Agricultural Chemistry, Plant Pathology, Entomology, Horticulture, Food technology, Minor plantation crops, Tobacco & soil conservation and Statistics.

With re-structure of the Department of Agriculture, three national Institutes were formed in 1994 to conduct research and development activities on horticulture, rice & field crops. The Central Agriculture Research Institute at Gannoruwa was renamed as Horticultural Crop Research and Development Institute to carryout efficient and intensive research & development work on horticulture.

Figure 3: Horticultural Crops Research and Development Institute

There are ten sub units comes under HORDI. Regional wise research activities are carried out at these sub stations with coordination of HORDI.

2. University Experimental Station- Dodangolla

The University Experimental Station is based at Dodangolla, Kundasale in the mid country intermediate zone (IM3) in Sri Lanka. The farm was established in 1968 for the purpose of utilizing for the undergraduate academic program offered by the Faculty of Agriculture, University of Peradeniya and provides great support in outreach training program and research opportunities, offered for various government, private and non-government organizations in the country and promote collaborative research with foreign universities, on agriculture and allied field of study.

	 Figure 4: A research activity in a polytunnel at University Experimental Station The farm occupies 79 ha (195 Acres) of land which is extending from sloppy landscape to flat landscape. Meanwhile, experimental station buildings, students and staff accommodation buildings, polytunnels, and the road network covers considerable land extent. The surrounding area is predominantly from sloppy landscape to flat landscape areas where the land use is mixed (agriculture, residential, commercial and scrublands).
Adjacent land and features	**1. <u>Horticultural Crops Research and Development Institute (HORDI)</u>** The HORDI administration complex, laboratories, and cultivation area are located on the land belongs to DOA. The land with an extent about 120ha (300acres) is allocated for the several government institutions comes under DOA in Gannoruwa. The area where HORDI is located belongs to Yatinuwara DS division of the Kandy district in Central Province. The area belongs to the Mid country wet zone. The mission of the institute is functioning as the national center for research and development of sustainable and productive technologies for horticultural crops to ensure economic and social development of the farmers, and other stakeholders. The HORDI promotes the Good Agricultural Practices (GAP) program for the quality assurance of agricultural products as healthy products through their research activities. As the development perspective, HORDI transfer new technologies which are developed by the research divisions to the agriculture extension officers, vegetable farmers, students (School, School of Agriculture & University) Entrepreneurs in the private sector. Improve the research extension linkage by coordinating research extension dialogue, technology demonstrations at farmer fields. Coordinating and testing of adaptability on research-proven technologies of HORDI at field level. The administrative complex and the labs are located together bounded to Gannoruwa Kandy road. The cultivation area used for the research activities is bounded by Kandy- Gannoruwa main road and Mahaweli river. There are many government institutions located surrounding area. They are; • Seed Certification and Plant Protection Center • Plant Genetic Resource Center (PGRC) • Gannoruwa Agricultural Complex

	• Agro Technology Park Unit • Agro Enterprise Development & Information Service • Quality Seeds and Planting Material and Agriculture Publications Sales Center • Inservice Training Center • Plant Protection Service • Fruit Crop Research and Development Station • Food Research Unit • National Agriculture Information and Communication Center • Plant Propagation and Nursery Management Division • Natural Resource Management Center • Vegetable Seed Center • Central seed Testing Laboratory • Veterinary Research Center (VRI) • Sri Lanka Army- Gannoruwa Camp • Provincial Surveyor General's Office • Hadabima Authority of Sri Lanka • Government Staff Quarters and Circuit Bungalows The Department of Agriculture is one of the few departments that has been established out of the capital city Colombo Sri Lanka. Therefore, many institutes affiliated with DOA are centralized in Gannoruwa and Peradeniya area. A part of DOA- owned land is used for the demonstration cultivations, research activities (cultivations), and agriculture park by the relevant institutions. Except for the DOA and other government agencies' owned land, there are no agricultural lands in the surrounding area. All the private lands located surrounding areas are residential or commercials. Mahaweli river flows adjoining the DOA-owned land. The opposite side of the Mahaweli River is bounded by the Royal Botanical Garden of Sri Lanka. **2. University Experimental Station- Dodangolla** The total land extent under experimental station is about 79ha (195 acres). This station has facilities for residential training programs, agricultural demonstrations and research trials. Students of the University of Peradeniya and students from other Sri Lankan and foreign universities conduct their Bachelors, Masters and Doctoral field experiments at this station. In addition, leading local and foreign private organizations use the unit for research purposes. Very importantly, the unit offers very good facilities for academia of the University of Peradeniya to conduct research programs. Approximately 50% of the station's land is covered with perennial tree species such as Teak, Coffee and Coconut.

	 Figure 5: A facility building located in the station This experimental site is located separately from other institutions and human settlement areas. The land is owned by the University of Peradeniya and vested by the faculty of agriculture. The surrounding area adjacent to the station is owned by private owners. The land use of the surrounding area is agriculture, residential and commercial. There is no encroachment, activities, or accesses of other parties are get affected or disturbed by the station's activities or vise-versa.

C. PROJECT JUSTIFICATION

Need for the project (What problem is the project going to solve	ASMP has launched its activities in nine districts of seven provinces of the country. Project Management Unit (PMU) and Provincial Project Management (PPMUs) directly implement the two kinds of subproject activities that mainly consist with Productivity Enhancement and Diversification Demonstrations and the infrastructure development programs. The Department of Agriculture (DOA) acts as the main project partner agency of Productivity Enhancement and Diversification Demonstrations. DOA's activities consist with designing of subprojects, training farmers, monitoring subprojects' activities and involving the troubleshooting of the program. Strengthening infrastructure and Technological/Technical capacities of the Department of Agriculture is an essential need to ensure provision services and follow up support for the farmer production organization (FPOs) established under the Component 2 of the Agriculture Sector Modernization Project (ASMP). This is further to the basic field facilities established for basic seed production of chilly and maize (FIELD CROPS CENTER), vegetables including potato (VEGETABLES CENTER) and the fruit crops (FRUIT Center), which the centers of excellence of the relevant crop categories established at Mahailuppallama (including Kilinochchi and Aralaganiwila), Gannoruwa/ Kundasale/ Dondagolla/ Seetha Eliya Complex, and Horana, respectively. Furthermore, addressing issues related to food safety are pivotal owing to the increased trend of non-communicable diseases in Sri Lanka, thus, prompting people be more health conscious in terms of food they

	consume. This is true for both processed or packed food as well as fresh produce. Though some of the safety standards and traceability systems are available for processed food, food safety certification for fresh agricultural produce is still a new concept to Sri Lankan consumers. Hence, apart from having basic seed production to support enhanced productivity drive and farmer livelihood development through the component 2 of the ASMP, fulfilling requirement of certified safe food is considered important through the promotion of SL- GAP program, which is in existence Sri Lanka since 2015. Insufficient production, scattered producers, non-continuous supply, poor marketing channels, and low consumer awareness on GAP-certified products have become major issues as at present that required immediate solutions. At present there is a gap in market requirement and the supply of GAP-certified products. Hence, expanding the SL-GAP program among the FPOs under the ASMP would provide quality agriculture produce at a lower price while providing high income for the SL-GAP farmers. Strengthening of seed and planting material production facilities of HORDI at Gannoruwa, and University Experimental Station at Dodangolla will be a sustainable solution for the continuing of modern technologies that are introduced to the farmers by ASMP. Therefore, launching of capacity building program at these institutions to enhance the quality assurance of agricultural products is an essential and mandatory requirement of the agriculture sector modernization. Agriculture in Sri Lanka is one of the sectors which has been given a prominent focus for a number of years where paddy cultivation is identified as the most important crop. However, over the years the horticulture sector which includes fruits and vegetables has been gaining significant prominence and is a major contributor to the overall agriculture sector. Sri Lanka's ability to grow a variety of fruits and vegetable crops year-round under different climatic zones has led to a keen interest both locally and internationally to further develop this sector due to the identified high potential. In recent times the potential and interest for the horticulture sector has intensified due to government policy and the Covid pandemic. The present domain of the horticulture industry in Sri Lanka is evolving and includes cultivation, plant propagation, breeding of plants, production of crops, plant physiology as well as biochemistry and genetic engineering. The use of biotechnology is also poised to enter the domain of horticulture in Sri Lanka. Sri Lanka's smallholder farmers are faced with increasing risks related to the impacts of climate factors, socio-economic conditions, technology transfer issues. Risk has always been a factor for farmers, and there are many traditional methods of risk management that have been developed over generations, including cultivation techniques, crop varieties, irrigation systems, soil management, natural insect and pest control, integrated crop-livestock systems, and livelihood diversification.

	In addition to employing these traditional methods, farmers can benefit from technology and modern knowledge to better manage their risks on different levels, such as agro-meteorological advisory, climate projections, crop insurance schemes, value addition, micro-irrigation, mechanization, or reduction of post-harvest losses. As a holistic approach, enhancing farmer capacities, agricultural input supply, and value chain is a sustainable effort for the industry. Meantime, the enhancement of the DOA's capacity as the main project partner agency of the ASMP is a mandatory requirement that should be accelerated for the better performance of the agriculture sector development. The ultimate effort of the ASMP is to establish good agriculture practices (GAP) in the farming activities by introducing new technologies. Therefore, strengthening of the seeds and planting material production facilities of HORDI at Gannoruwa and University Experimental Station at Dodangolla is considered an essential and timely need for quality assurance of agricultural products which can be utilized by other public and private sector agencies to enhance the safe food and good health of the people in Sri Lanka.
Purpose of the project (*What is going to be achieved by carrying out the project*)	The project will directly result the strengthening of planting material production facilities at HORDI- Gannoruwa and University Experimental Station- Dodangolla. Ultimately, it gives the benefits to the farmers who have engaged in vegetable cultivation in the country. The following purposes will be achieved by implementing the subproject. • Continuing research and development activities of horticultural; crops by HORDI and Faculty of Agriculture-University of Peradeniya and sharing technology and knowledge with local and foreign universities, agriculture schools, private agricultural firms, other academic centers, and stakeholders • Conducting development programs to transfer new technologies which are developed by the research divisions to the agriculture extension officers, vegetable farmers, students (School, School of Agriculture & University) Entrepreneurs in the private sector. • Improve the research extension linkage by coordinating research extension dialogue, technology demonstrations at farmer fields. Coordinating and testing of adaptability on research-proven technologies of HORDI at field level. • Transferring Technologies released by the Food Research Unit and the findings regarding the new disease identification and confirmation through molecular techniques to farmers and other stakeholders • Continuing to diagnose to identify the pest and diseases attacks, nutrient deficiency, and other challenges for the horticultural crop management. Giving recommendations and creating awareness of the stakeholders to overcome the issues. Meantime, conducts the analysis to identify the residual impacts of the agriculture inputs and

	the management activities. To achieve this objective HORDI carry out soil sample analysis, fertilizer sample analysis, compost analysis, water sample analysis, plant sample analysis, bio-efficacy testing of special fertilizer, training programs, quality analysis laboratory reports, research facilities, advising and consulting, and awareness programs are being conducted • Releasing new crop varieties- Continues research activities to release the high yielding, pest and diseases resistant, drought resistant and high food quality contains crop varieties. • Supplying quality seed and planting material to seed production farmers, private institutions, and other interested groups for multiplication. Through this program, hope to enhance the local seed supplying. The ultimate effort of the ASMP is to establish good agriculture practices (GAP) in the farming activities by introducing new technologies.
Alternatives considered (*Different ways to meet the project need and achieve the project purpose*)	There is no private sector program for conducting research and development activities in the country on horticultural crops. HORDI is the mandatory institution responsible for this service. Currently, HORDI does not have adequate facilities to support the horticultural crops planting material production since they have limited resources. Dissemination of new crops varieties to farmers/ growers needs additional trustworthy support from the outsider. Even though there is private sector involvement in seed production, their services are very narrow and are limited to their own needs only. Hence, there is a gap to be filled and the government sector involvement is essential. The farmers keep trust in the government sector service since there is a trustworthy service and DOA has improved human capital to deliver the service. The faculty of agriculture is the leading academia in agriculture science in Sri Lanka. They have undertaken a remarkable responsibility for the agriculture sector development of the country. For more than seven decades, they have contributed to the sector by introducing modern technology through research activities and producing agriculture professionals in the country. The university experimental capacity has also been identified to be strengthened under ASMP. Therefore, ASMP together with DOA have identified the need for a subproject and decided to enhance the planting material production facilities through the capacity building program. Supplying of land vehicles for HORDI and University Experimental Station, Rehabilitation of existing cold storage facility and strengthening seed processing facility at HORDI are identified as the only alternative under this subproject since it gives the maximum output for the least investment. There is no alternative to be considered since there is well established system in the sector.

D. PROJECT DESCRIPTION

Proposed Start Date (Duration)	March 2022 (02 Months)
Proposed completion Date	April 2022
Estimated total cost	SLRs 20.0 Mn
Present Land Ownership	HORDI is located in Gannoruwa on the state land that is under the purview of the DOA. The university experimental station is located on the land that belongs to University of Peradeniya and vested to the Faculty of Agriculture.
Description of the Project (*With supporting material such as maps, drawings etc. attached as required*)	The following activities are included as the subproject activities. 1. Purchasing and supply land vehicles for HORDI and University Experimental Stations, Dangolla 2. Rehabilitation of existing cold storage facility at HORDI 3. Supplying and install the equipment required for seed processing facility at HORDI
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 PROPOSED SUBPROJECT ACTIVITIES

Existing Condition of the Facilities	**<u>Horticultural Crops Research and Development Institute (HORDI)</u>** The HORDI has land vehicles to use for land preparation and other cultivation activities. Many of these land vehicles are in not in good condition and require repairing. The land vehicle fleet of the center is not enough to undertake the activities without interruptions. Meantime, HORDI has cool storage facilities required for the experiments. This facility should be enhanced to cater to the present demand in the center. For many years, this cool storage facility has not been expanded. And HORDI has planned to enhance the facility with funds under ASMP.  Figure 6: A cool Store room of the center Seed processing is an important service/ activity in the research station. Presently, research staff/ workers manually do the seed thrasher, sorting, and other activities. Or they use conventional methods in seed processing. It is more time-consuming operations and human errors may be high in the manual method. Then, it causes errors in the experiments, investigation. Hence HORDI proposed to modernize the seed processing activities by supplying the required equipment for seed processing activities under ASMP. **<u>University Experimental Station- Dodangolla</u>** The university experimental station has land vehicles to use for the land preparation and other cultivation activities. Many of these land vehicles are in not in good conditions and require a repairing. The land vehicle fleet of the center is not enough to undertake the activities without interruptions.

	 **Figure 7: Use of land vehicles** DOA and University of Peradeniya annually allocate funds for the recurrent expenditures to undertake the services and the research activities undertaken by these three institutions but there are low allocations for the capital investment. ASMP and DOA together conduct the consultation sessions with relevant officials and identified to need of strengthening the HORDI and University Experimental Station's services through capacity building component of ASMP
2. Other factors	
Solid waste	The crop residuals and organic waste generated in these institutions are properly disposed of using safety & health precautions to keep the hygienic conditions at the research stations and the farmlands. The agrochemical waste, lab chemical waste, and used chemical containers are kept in separate safe stores established in the centers until proper disposal. This store is being monitored by special audit teams of the relevant authorities (DOA and University) timely whether there is quantity and process are going properly. This is a special and important process observed during the screening process. DOA/ University selects a contractor who has the facilities for the insulation of this waste at higher temperature (through Cement Kiln Co-processing) as approved and appropriate method. Most often, the cement factories have been selected as the qualified contractor for this job. This process is being monitored by the DOA's special audit team timely whether there is quantity and process are going properly

F. DESCRIPTION OF THE EXISTING ENVIRONMENT

1. PHYSICAL FEATURES – ECOSYSTEM COMPONENTS	
Topography and terrain	**1. <u>Horticultural Crops Research and Development Institute (HORDI)</u>** Geologically, the Gannoruwa area belongs to the Highland Complex of Sri Lanka and the elevation is below 600m AMSL. The site of the proposed subproject is located at Gannoruwa East in Yatinuwara Divisional Secretary Divisions in Kandy District. Kandy is surrounded by a triangular mountain range, namely the Hantana and Knuckles Mountain ranges. The elevation of these entrances is approximately 450 m in the North side (A 10 road), 520 m on the Eastern side (A 26 road), 580 m Southern side (B 39 road), and 530 m Western directions (A1 Road) respectively. The proposed project site is located within the wet zone of the country. The topography of the project area is characterized by steep dip slopes towards west and south, and steep hilly terrain towards north and east. The project site falls into Wet Zone Mid Country of Sri Lanka and the features of this area are WM2bAgro-ecological zone. **<u>2. University Experimental Station- Dodangolla</u>** Geologically, the Gannoruwa area belongs to the Highland Complex of Sri Lanka and the elevation is below 500m AMSL. The university experimental station is located at Dodangolla. The site belongs to the Kundasale DS division in Kandy District. The institute's land is bounded to A26 road (which connects Kandy-Padiyathalawa). The university experimental station belongs to the mid-country Intermediate zone. The topography of the project area is characterized by steep hilly terrain towards north and east. The project sites fall into Intermediate Zone Mid Country and the features of the area is IM3 Agro Ecological Zone
Climate and Meteorology	**<u>HORDI- Gannoruwa Area</u>** Climatically the area belongs to Mid Country Wet Zone and the average temperature varies between 22.1°C and 24.7°C. The zone receives annual rainfall more than 2,500mm and average 2,950mm. Relative Humidity varies from 74% during the day to 84% at night. **<u>Dodangolla Area</u>** Dodangolla area belongs to Mid Country Intermediate Zone and the average temperature is 24.5ºC and maximum and minimum is 28°C and 19°C respectively. The average annual rainfall varies from 2,200 mm to 2,900 mm and average 2400mm. Relative Humidity varies from 70% during the day to 90% at night
Soil (*type and quality*)	**<u>HORDI- Gannoruwa Area</u>** Riverbanks consist of slightly weathered to fresh bedrock overlying with thick residual and colluviam overburden materials. Intake is planned along the right bank of the river. The geological soil type of the proposed channeling area is a mixture of residual and colluviam soils which has a varying thickness from place to place. Bedrock exposures and a few boulders can be observed at

	places within the stream. The soil type of the area is reddish brown latasolic soil with dissected hilly and rolling terrain. The area is identified as a landslide-prone area as per the National Building Research Organization-2004 Sri Lanka. **<u>Dodangolla Area</u>** The soil type of Dodangolla area is Immature Brown Loams, Reddish Brown Latazolic soils and Reddish-Brown Earths with dissected hilly and rolling terrain. The Kundasale area is identified as landslide-prone area as per the National Building Research Organization-2004 Sri Lanka
Surface water (*Sources, distance from the site, local uses and quality*)	**<u>HORDI- Gannoruwa Area</u>** The project area lies adjacent to the Mahaweli river and it is the only surface water body located in the vicinity of the project area. **Uses:** The local people use the river water to meet some of their domestic needs, such as washing, bathing, etc. No irrigated lands are noted within the project area and water extraction for irrigation purposes is negligible. In the vicinity of the project area, surface water bodies seem not abundant apart from the Mahaweli River and Meda Ela. **Quality**: At present, there is no detailed background information on surface water quality in these water bodies apart from a few studies done in the past by several organizations. The project area lies close to the Mahaweli river and it is only surface water body located in the vicinity of the project area. **<u>Dodangolla Area</u>** The seasonal stream and earthen ponds are the only surface water bodies located in the vicinity of the project area. **Uses:** The local people use the seasonal streams and earthen ponds to meet their irrigation, washing, needs and for animal washing, etc. **Quality**: At present, there is no detailed background information on surface water quality in these water bodies.
Ground water (*Sources, distance from the site, local uses and quality*)	**<u>HORDI- Gannoruwa Area</u>** The groundwater table is relatively shallow in areas close to the river. However, due to the sloping terrain, the groundwater table lies fairly deep in hilly areas. Houses located in the valley areas, use shallow well water for domestic consumption; however, use of such wells is not widespread within the project area due to the availability of pipe-borne water. Most of the residents in the area use pipe-borne water for consumption, but their old wells are still in use for purposes such as bathing and washing. The quality of groundwater present in this area is moderate in condition and use for drinking, washing/ bathing, and cultivation activities. **<u>Dodangolla Area</u>** Due to the sloping terrain, the groundwater table lies fairly deep in hilly areas. Houses located in the valley areas, use shallow well water for domestic

	consumption; however, use of such wells is not widespread within the project area due to the availability of pipe-borne water. Most of the residents in the area use pipe-borne water for consumption, but their old wells are still in use for purposes such as bathing and washing. The quality of groundwater present in this area is moderate in condition and use for drinking, washing/ bathing, and cultivation activities
Air quality (*Any pollution issues*)	Any major pollution source near the Gannoruwa and Kundasale areas are not recorded
Noise	No any noise pollution sources in the vicinity of the stations.
2 ECOLOGICAL FEATURES – ECOSYSTEM COMPONENTS	
Vegetation (*Trees, ground cover, aquatic vegetation*)	**HORDI- Gannoruwa Area** The proposed project area belongs to the WM2b Agro-ecological Zone map of Sri Lanka. No natural vegetation/habitats exist in and around the proposed project area except the river and its disturbing riverside vegetation. The whole land belongs to HORDI except the built-up area is used for the cultivations and to establish the propagation houses (Polytunnels, glasshouses, net houses, etc.). The HORDI land is surrounded by the government-owned land occupied by the many government agencies and most of these institutions are the DOA affiliated institution. Government institutions have used the land to establish their office premises building, and cultivations (use for research and model farming activities). The balance part of the land is scrublands that are covered with shrubs, grasses, etc. The area used for the different government institutions is surrounded by privately owned land but no agricultural lands are observed. All privately owned lands are residential or commercial. The residential land consists of a house and a home garden. The Kandyan Home Garden (KHG) is prominent vegetation as well as landscaping model observed in the area. KHG model can be observed in Kandy and adjacent districts, such as Badulla, Kegalle, Kurunegala, Matale, Nuwara Eliya, and Rathnapura. This area largely falls in the wet zone of Sri Lanka but occasionally in the intermediate zone, where the climate and environment support the luxurious growth of perennial trees. The area consists of deep soil (i.e., reddish-brown latasolic, immature brown loam, and red-yellow podzolic soils). The rainfall is year-round, sufficient to meet the evaporation demand of the atmosphere, with a distinct dry spell of one to two weeks that triggers the flowering of perennial species. KHGs are considered a result of farmers' conception, investment, and long-term planning. The main components (tree categories) of KHG are ornamental, medicinal, spices, fruits, food, fuel, and timber. Livestock is also an important part of the KHG. The common flora species observed in the area are *Mangifera zeylanica*- Atemba, *Durio zibethinus Murr*. - Durian, *Artocapus heterophyllus*- Jackfruit, Artocarpus nobilis- Waldel, Musa spp. L. Kesel, *Psidium guineense*- Cheena pera, *Psidium montane*- Embulpera, Persea americana- Avacardo, Eriobotrya japonica- Japan batu, Nephelium lappaceum L. Rambutan, Citrus spp., *Theobroma cacao* L. Cocoa, *Lantana camara* L.-

	Gandapana, *Syzygium aromaticum*- Clove, *Myristica fragrans*- Sadikka, *Piper nigrum* – Pepper. **<u>Dodangolla Area</u>** The proposed project area belongs to the IU3 Agro-ecological Zone map of Sri Lanka. The university experimental station is surrounded by private home gardens that are mostly like as Kandyan home garden that is described above. There is distinguish change in vegetation than above since the area belongs to the IM3 Agro ecological Zone. No natural vegetation / habitats exist in and around the proposed project area Scrub lands are covered with shrubs, grasses etc. Perennial crop such as Jack, coconut and other plants of fruit varieties could be seen in the project study area. There are Kumbuk (Terminalia arjuna), Kottamba (Terminalia catappa), Tabebuia rosea, Amba (Mangifera indica), Pulun (Ceiba pentandra) trees. The whole land belongs to Dodangolla farm. Human settlement cannot be seen immediate vicinity of the project site except the buildings belongs to the farm
Presence of wetlands	No wetlands present in the area adjacent to research station
Fish and fish habitats	Mahaweli river and open water body, Kandy Lake, irrigation canals, earthen pond and seasonal streams are water bodies that are ideal for fish habitat and also found with freshwater fish varieties.
Birds (*waterfowl, migratory birds, others*)	The Gannoruwa and Dodangolla areas are closer to the waterways (Mahaweli river) and agricultural lands and there is a possibility of recording bird species in these habitat types. The most common birds species found in and around the project locations are, Orthotomus sutorius (Common Tailorbird), Turdoides affinis (Yellow-billed Babbler), Corvus splendens (House Crow), Acridotheres tristis (Common Myna), Eudynamys scolopacea (Asian Koel), Dicaeum erythrorhynchos (Pale-billed Flowerpecker), Accipiter badius (Shikra), Spilornis cheela (Crested Serpent Eagle), Nectarina lotenia (Loten's Sunbird), Pycnonotus cafer (Red-vented Bulbul), Halcyon smyrnensis (White-throated Kingfisher), Bubulcus ibis (Cattle Egret), Columba livia (Rock Pigeon), Streptopelia chinensis (Spotted Dove), Centropus sinensis (Greater Coucal), Dicrurus caerulescens (White-bellied Drongo), Hirundo daurica (Red-rumped Swallow), Copsychus saularis (Oriental Magpie Robin).
Presence of special habitat areas (*special designations and identified sensitive zones*)	Udawattakele sanctuary and Gannoruwa forest reserve presence as a special habitat area are reported in surrounding area, but not within the 2 km radius of the HORDI premises and Dodangolla area. According to environment sensitive areas map of CEA, no any environmental sensitive area recorded in the close proximity of the project site
3 OTHER FEATURES	
Residential/Sensitive Areas	All farming areas are located separately from the other institutions and they do not impact sensitive areas such as hospitals, schools, etc..

(*E.g., Hospitals, Schools*)	
Archaeological resources (*Recorded or potential to exist)*	The HORDI is located on DOA owned lands and Dodangolla experimental station is located in university owned land. There is no archaeological or Physical Cultural Resource (PCR) to record or potential to exist.

G. SOCIO-ECONOMIC ENVIRONMENT

1. Stakeholders and Public consultation

Stakeholders' engagements

The Department of Agriculture is the main project partner agency of this subproject. The staff of the HORDI, and Agriculture Faculty (University of Peradeniya) jointly prepared their capacity needs and submitted them to the ASMP. Several discussions were undergone to finalize the subproject activities between the HORDI, university staff and the ASMP. For more transparency, the relevant institution staff were represented the technical evaluation committee of this subproject.

The ASMP PMU staff conducted site visits, consultations with DOA's officials during subproject identification and designing stages.

Table 1: Responsible Officers in HORDI Project Activities

SN	Name	Designation	Contacts
1	Dr. (Ms.) S.K. Wasala	Additional Director General of Agriculture (Research)-DOA	samanthiwasala@gmail.com
2	Prof. K.W.L.K. Weerasinghe	Senior Lecturer- Faculty of Agriculture, University of Peradeniya	0714462995
HORDI- Gannoruwa			
3	Ms. W.A.P.G.Weeraratna	Director/ HORDI	gethweerarathna@yahoo.com
Plant Breeding Division			
4	Ms.N.L.A.T.S. Nanayakkara	Head of the Division Assistant Director of Agriculture (Research)	subodhinit@gmail.com
5	Ms. H.M.P.S. Kumari	Assistant Director of Agriculture (Research)	pabakumari68@yahoo.com
6	Ms. H.M.V.T.Welegama	Assistant Director of Agriculture (Research)	tharanganiwelegama@gmail.com
7	Ms. R.G.S.Iroshani	Assistant Director of Agriculture (Research)	shyaliiroshani@gmail.com
8	Ms. N.B.U.Dissanayaka	Assistant Director of Agriculture (Research)	bhagyadissanayaka@ymail.com
Pathology Division			
9	Ms. W.A.P.G.Weeraratna	Agriculture Principal Scientist (Plant Pathology)	gethweerarathna@yahoo.com

	10	Ms. M.S.W.Fernando	Assistant Director of Agriculture (Research)	sobashinifernando@gmail.com
	Agronomy Division			
	11	Ms.D.P.Karunananda	Agriculture Principal Scientist (Agronomy)	dayani.karunananda@gmail.com
	12	Ms.K.A.D.S.D. Kahadawaarachchi	Assistant Director of Agriculture (Research)	dilrukshi_sandya@ymail.com
	13	Ms.K.H.S.T.Deshabandu	Assistant Director of Agriculture (Research)	khstdeshabandu@yahoo.com
	14	Ms. H.M.P.T.K.Hettigedara	Assistant Director of Agriculture (Research)	hettigedara64@yahoo.com
	Entomology Division			
	15	Mr.S.S.Weligamage	Agriculture Principal Scientist (Entomology)	senaniweligamage@gmail.com
	16	Mr. K.M.D.W.P. Nishantha	Assistant Director of Agriculture (Research)	wpnishantha@yahoo.com
	17	Ms.P.H.Ranaweera	Assistant Director of Agriculture (Research)	ranaweerapra@yahoo.com
	Soil and Plant Nutrition Division			
	18	Ms. N.R.N. Silva	Principal Agriculture Scientist (Soil Science)	renukasilva@yahoo.com
	19	Mrs. K.K.K. Nawarathne	Assistant Director of Agriculture (Research)	kkknawaratna@yahoo.com
	Food Contaminant Analytical Division			
	20	Ms.C.Magamage	Principal Agriculture Scientist (Analytical Chemistry)	champamgmg@gmail.com
	21	Ms.P.W.Y. Lakshani	Assistant Director of Agriculture (Research)	jayayoshil@yahoo.com
	Extension and Communication Division			
	22	Ms.K.A.S. Thilakarathne	Assistant Director of Agriculture (Development)	arunisriya@gmail.com
	University Experimental Station- Dodangolla			
	23	K.G.S.N. Amarasiri	Farm Manager	

Stakeholders' consultation

During the social and environmental screening process, the staff of DOA, University of Peradeniya, and HORDI 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 among the stakeholders. Due to the impact of the fruitful consultation process undertaken by the ASMP, the DOA and University staff are well aware of the subproject activities and their objectives. Meantime, they have negotiated and decided the real requirements that they want to enhance the service of the institute

Table 2: Consultation outputs

Locations / Sub Units / Fields Visited	Participants with Designations	Matters Discussed
DOA- Peradeniya- 19.01.2022		
ADG (Research) Office, DOA	Dr. (Ms.) S.K. Wasala Additional Director General (Research)	Overall capacity building plan to be implemented with ASMP assistance
Faculty of Agriculture, University of Peradeniya- 19.01.2022		
Faculty of Agriculture	Prof. Buddhi Marambe	

	Senior Professor Prof. K.W.L.K. Weerasinghe Senior Lecturer	Requirement of land vehicles for University Experimental Station
HORDI Gannoruwa-19.01.2022		
Director Office, HORDI	Ms. W.A.P.G.Weeraratna Director/ HORDI	Proposed subproject activities
Analytical Laboratory (Pesticide residuals & Heavy metals)	Ms.P.W.Y.Lakshani, Assistant Director of Agriculture (Research) Ms. Chamila Vaidyarathne Research Assistant	• Routine functions of the lab Overall environmental and social risks/impacts • Safety precautions that are implemented • Rehabilitation of existing cool storage and seed processing facilities of the research station • Waste disposal
Sample Receiving Point	Mr.Asanga Panditharathna Sample receiving Officer	
Plant Pathology Division	Ms.Kanchana Dissanayake, Programme Assistant Ms.Shyamali Kohombange Research Assistant Ms. Nishani Research Assistant Ms.Nishadi Samarakoon Research Assistant Ms.N.M.S.Maheshika Technical Assistant Ms.W.Anurudhdhika Technical Assistant Mr.R.W.Weerasekara Technical Assistant	
Soil & Plant Nutrition Division	Ms.Renuka Silva Principal Senior Scientist (Soil Science)	
Microbiology Laboratory	Ms.Kumudu Nawarathna, Assistant Director of Agriculture (Research)	
University Experimental Station, Dodangolla- 20.01.2022		
University Experimental Station	Mr.W.M.I.N.D.Abeysingha, Technical Officer	• Farm machinery usage in the station

H. 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 construction works. Only supply of land vehicles and repairing & upgrading of existing cool storage and seed processing facilities will be done
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?		√		No such impacts will be anticipated from the proposed civil works of the subproject
4	Will the project interventions involve with encroachment on or impact ecologically sensitive or protected areas?		√		No such impacts will be anticipated from the proposed civil works of the subproject
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?		√		No construction works are associated with the subproject
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 construction works are associated with the subproject
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 construction works are associated with the subproject
8	Will the project interventions involve with noise and vibration due to blasting and other civil works?		√		No construction works are associated with 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		√		No such impacts are anticipated

SN	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
	communicable diseases from workers to local populations due project interventions?				
10	Will be possible to creation of temporary breeding habitats for mosquito vectors of disease?		√		No such impacts are anticipated
11	Will there be risk of accidents associated with the increased vehicular traffic due to project interventions?		√		No construction works are associated with the subproject
12	Will the project activities increase the risk of water pollution from oil, greases and fuel spills, and other materials?		√		No such impacts are anticipated
13	Will the project activities involve with additional waste in water canals that may increase floods and waterlogs?		√		No such impacts are anticipated
14	Will the project activities involve with new/restored public areas/ spaces that can be inundated in case of floods?		√		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?		√		No such activities are included
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.?)		√		No civil works are included in in subproject activities. Only supply of land vehicles and repairing & upgrading of existing cool

SN	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
					storage and seed processing facilities will be done
18	Will the Project involve use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?		√		No such substances are involved with this subproject
19	Will the Project produce solid wastes during construction and/ or operation?		√		No civil work associated. But the crop residuals, and organic waste will be generated during the operation period of cool storage and seed processing facilities. The crop residuals and organic waste will be burnt and disposed within HORDI land.
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
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 such impacts are anticipated
24	Will there be any risks and vulnerabilities to public safety due to physical hazards during construction or operation of the Project?		√		No such impacts are anticipated
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?		√		No such impacts are anticipated
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 such impacts are anticipated
27	Are there any areas or features of high landscape or scenic value on		√		No such impacts are anticipated

SN	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
	or around the location, which could be affected by the project?				
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 impacts are anticipated
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 such impacts are anticipated
30	Is the project located in a previously undeveloped area, where there will be loss of green field land		√		No such impacts are anticipated. The lands are exclusively allocated for the relevant institutions only
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 such impacts are anticipated
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?		√		No such impacts are anticipated
34	Are there any areas in or around the location which are densely populated or built-up, which could be affected by the project?		√		No such impacts are anticipated
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?		√		No such impacts are anticipated
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 such impacts are anticipated
37	Are there any areas in or around the location, which are already subject to pollution or environmental damage e.g., where existing legal		√		No such impacts are anticipated

SN	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
	environmental standards are exceeded, which could be affected by the project?				

I. 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
Purchasing and supply land vehicles for HORDI and University Experimental Stations, Dangolla	NA	
Rehabilitation of existing cold storage facility at HORDI	NA	
Strengthening seed processing facility at HORDI	NA	

L. EMP IMPLEMENTATION RESPONSIBILITIES AND COST

Contractor's Responsibility for Mitigating Adverse Environmental Issues

The subproject includes only supplying land vehicles, rehabilitation of existing cool storage, and upgrading of seed processing facilities. Hence, no civil/construction works include in the subproject. There is a well-established system to manage the land vehicles. The operation of cool storage and seed processing is governed by the well-established operation system in HORDI. Through this, subproject, the existing operations of the cool storage and seed processing will be qualitatively and quantitively upgraded. Therefore, no anticipated impacts are identified to develop an environmental management plan to be followed by the contractor (land vehicles and facility enhancement suppliers) during subproject implementation.

J. EMP IMPLEMENTATION RESPONSIBILITIES AND COST

The overall responsibility of ensuring compliance with safeguard requirements rests with the PMU. The PMU is directly responsible for reviewing the proposed activities are aligned with environmental safeguards compliances. The overall supervision will be carried out by the in-house staff of the PMU supported by the staff in research centers. Any consequent modification or amendments of subproject will be negotiated prior to implementation with ASMP and DOA staff with notification to the WB's office.

Environmental & Social monitoring will be carried out largely through visual observations and compliance monitoring using the checklist provided in the EMF & RPF by the Safeguard Specialist of the PMU and the DOA jointly. The Environmental and Social Safeguards Specialist will need to visit the site quarterly and report on issues and performance on environment management of the subproject.

M. DETAILS OF PERSON RESPONSIBLE FOR THE ENVIRONMENTAL SCREENING

This project does not require environmental clearance under national environmental regulations. Supplying equipment and land vehicles for the well-established system will be done by ASMP. Hence, 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 operation period and there is a set of activities which needs to manage the negative impacts while enhancing positive impact to the environment. The impacts on the physical and biological environment are virtually none.

N. 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** January 2022 ***Signature***
Screening report approved by **Dr. Rohan Wijekoon** Project Director Agriculture Sector Modernization Project ***Name/Designation/Contact information***	**Date** January 2022 ***Signature***

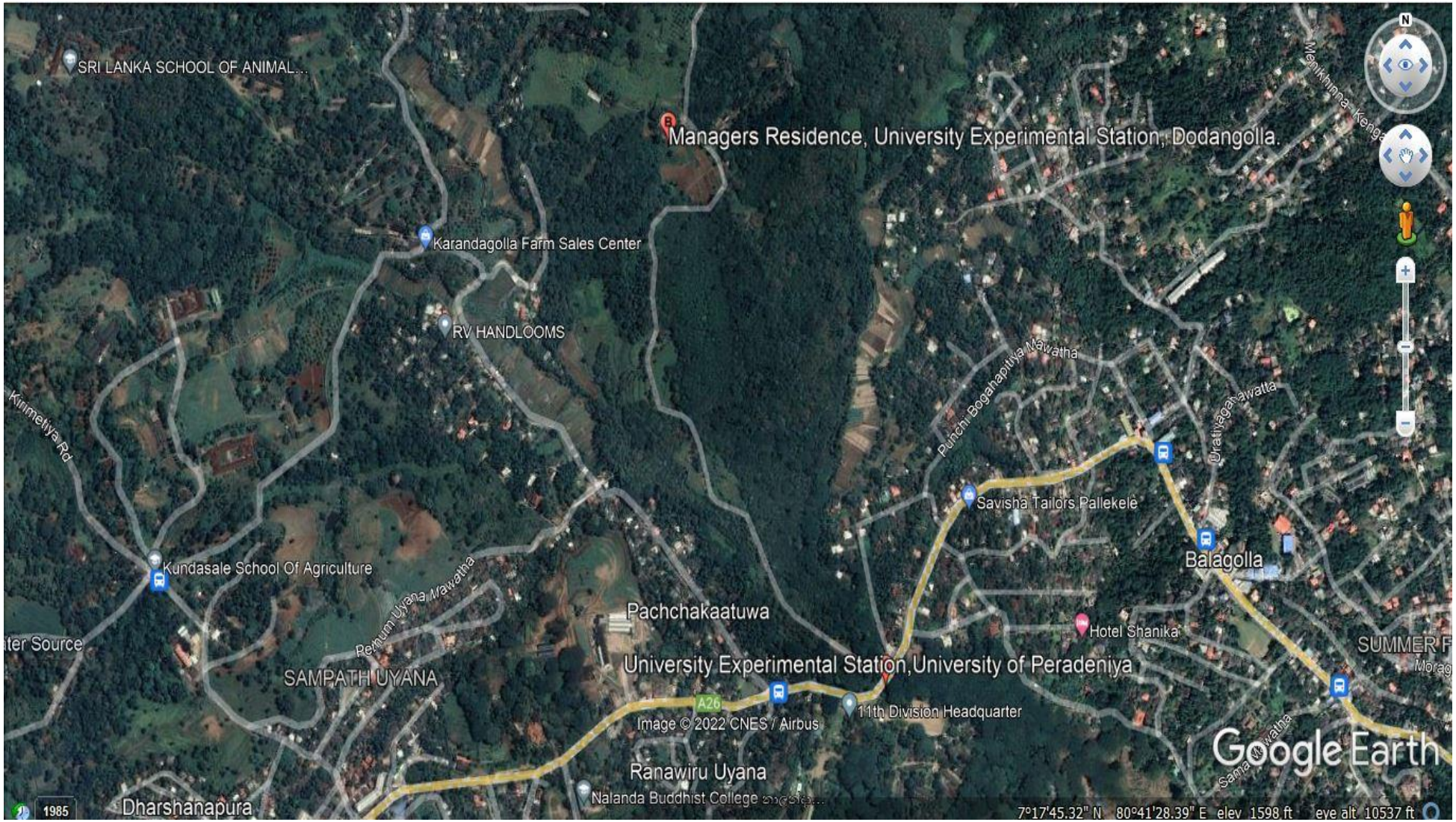
O. ANNEXES

Annex 1: Google Map/ Location Map

1. Horticultural Crops Research and Development Institute at Gannoruwa

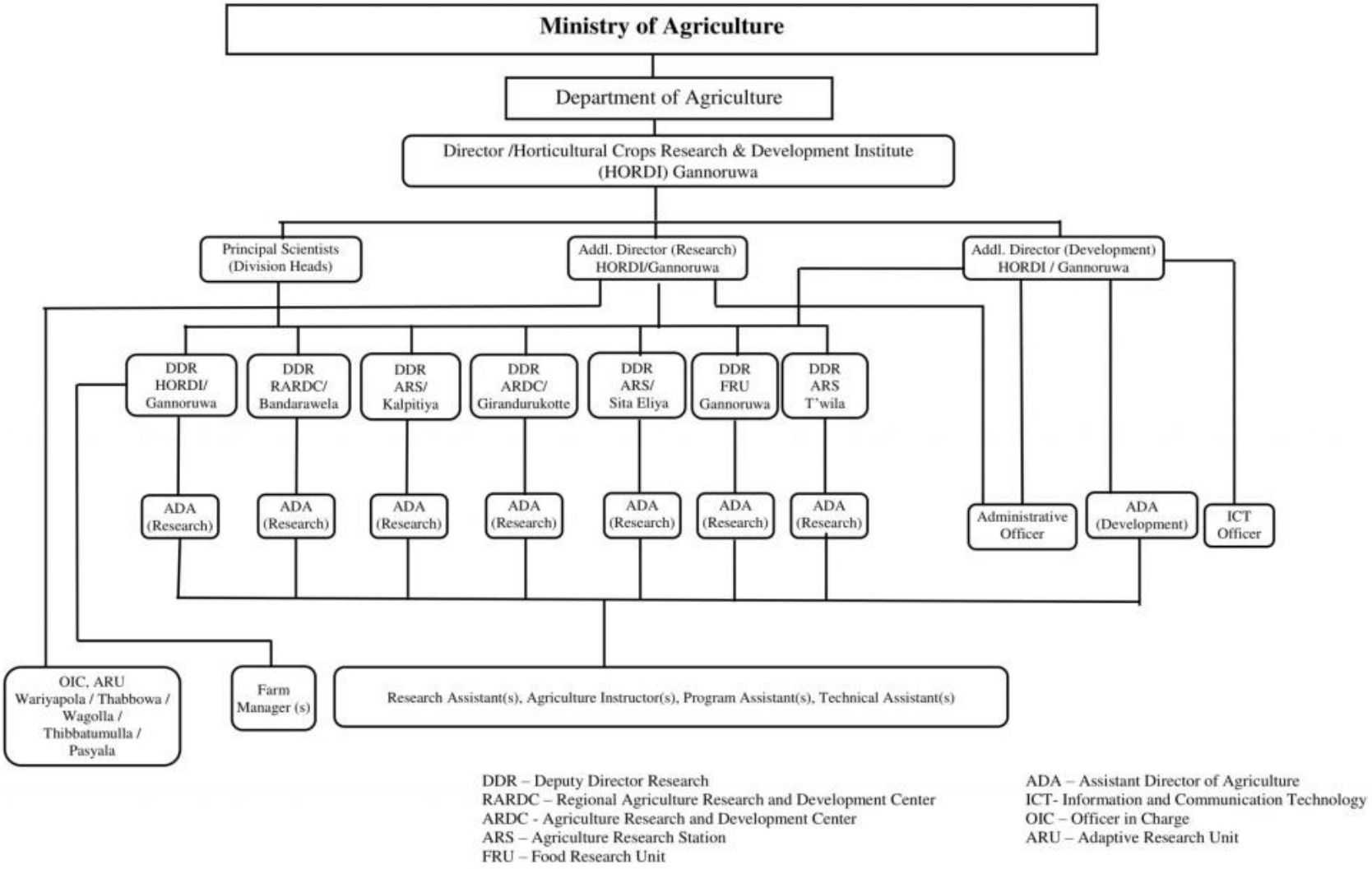
Source: Google Map

2. *University Experimental Station at Dodangolla, Kundasale*



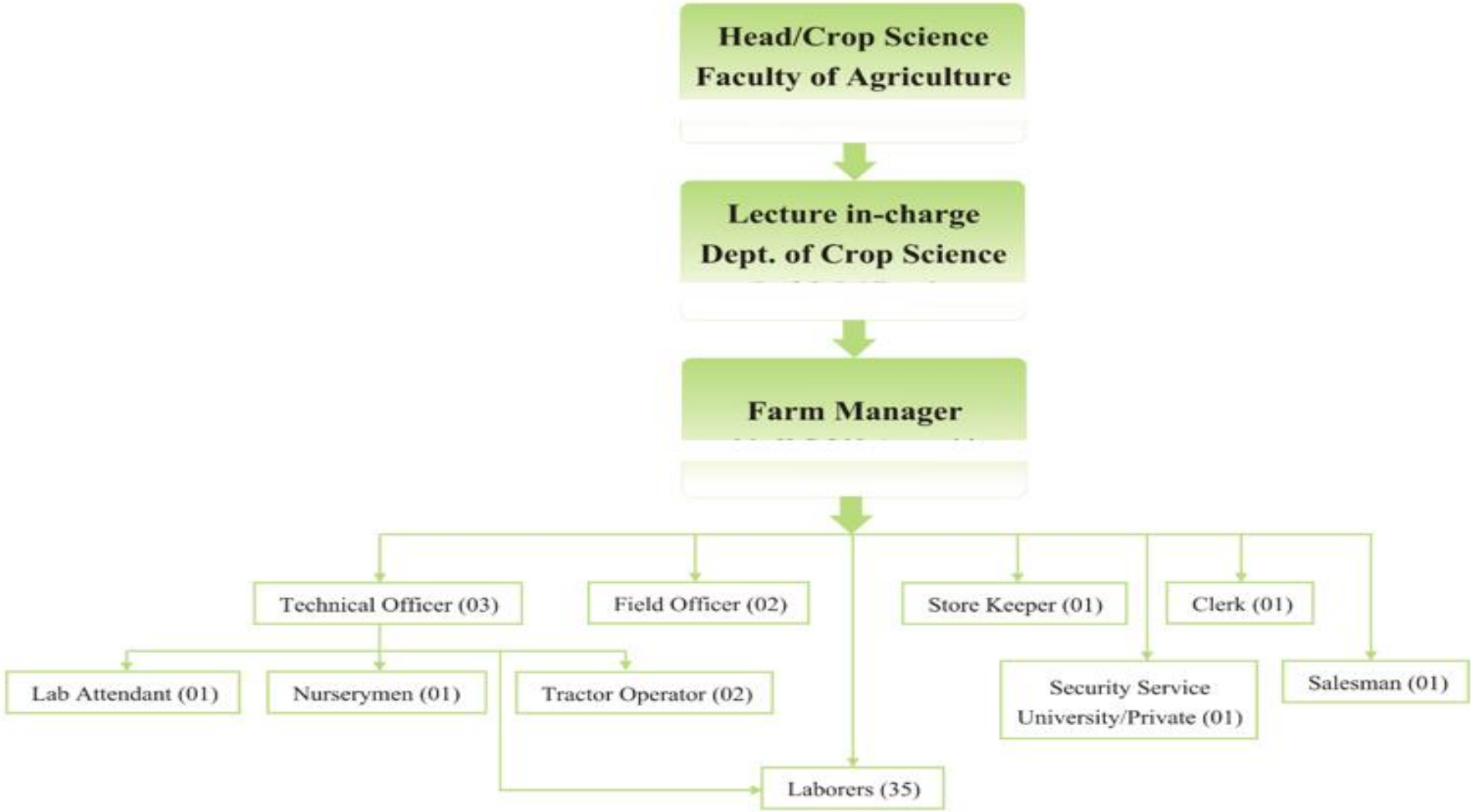
Source: Google Map

Annex 2: Organizational Structure of HORDI



Source: HORDI Home page – Department of Agriculture Sri lanka (doa.gov.lk)

Annex 3: Organizational Structure of University Experimental Station- Dodangolla



Source: agri.pdn.ac.lk/farms/dodangolla/about.php