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Assignment Type – Project Proposal Report

(Guiding Web Application On Modern Home Gardening)

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Problem Background.

Problem

During covid-19, people began home gardening and after withdrawing it home gardening did not begin. When covid-19 stayed in the houses. It's because there's no time for people to proceed.

Solution

This period is the most difficult time we have ever experienced globally. The shops are empty, people are separated and going out has become a luxury we can only dream of. In fact, the good old days seemed like years ago. But, that means you have to get lost.

At this moment our best option is to do new things, to discover new methods, to do new things in everyday activities and to do what you love in a more secure environment.

Several countries around the world have been inactive this year. Within 5 to 6 months, some of them are now locked due to the Kovid-19 eruption. This has caused a huge loss to the global economy as many economic companies have to slow down their workflow. Economics vary across continents. Some rich countries have completely poor economies, some countries with different economies depend on their educational performance.

Sri Lanka is the best factor for that. Our country has many jobs that people do based on education and personal aspirations. Everyone had to stay at home until the day the lock burst was brought under control, and many people had a lot of problems with their daily lives due to the huge financial damage caused by the closure. Many citizens were unable to pursue regular meals. The government implemented short-term strategies, including the distribution of funds to the needy. They also suggested long-term ideas such as gardening, which would at least help cover residents.

Many consider it a golden resource because of its well-maintained indoor garden, its ability to provide large quantities of regular food, and its need for a lucrative income. The Sri Lankan government has unveiled this new home gardening strategy after the start of the lock-in era in March. It became a theme in every dimension of the world. Housewives, husbands, teenagers and the whole family started planting different varieties of plants.

So, with the temporary disappearance of covid-19 from the society, people have started to stop planting seedlings. Because people don't have time to stay home. Again, due to the current situation in the country, people have started cultivating again. This is made possible by the web application we create under the right guidance. It directs people to grow seedlings properly under proper techniques.

Benefits of home gardening.

Planting takes many varieties, from indoor planting to large-scale land distribution. In addition to indoor development, gardens provide warmth, atmosphere and pleasure. Many people grow plants not only for market purposes but also for their own non-toxic food and for self-satisfaction.

Simple to find

Gardening provides instant access to fresh produce, which means you do not have to go to a supermarket or farmer's market to get it. It saves you time and money on diesel instead of driving elsewhere to buy goods. You can save money on food depending on the type of plant you produce. Growing vegetables at home costs money for things like seeds and pesticides, but most products are often made from a single plant, which means many people can save money by growing their own food.

Tests

You have complete control over the chemicals and additives used in your own food growing process. In a grocery store, organic produce usually costs more, but organic fruits and greens can be grown at home by removing artificial fertilizers and pesticides. You have to pick when the garden matures. Harvested storage items until fully prepared. Newly selected items from the garden are different from supermarkets in that they have no taste and no compatible chemicals and were purchased a few days or weeks before the sale. Shortly after harvest, merchandise retains more nutrients and makes your homemade vegetables a better alternative.

How it affects the atmosphere

A garden provides an opportunity to create a positive impression of the climate. Compost stocks allow you to recycle garden fertilizer additives from kitchen and yard waste. This minimizes the pollution you create and provides natural fertilizer to your plants. If you want to eliminate or limit the use of chemicals, it will reduce the pollution of your yard and groundwater. Horticultural plants also reduce erosion through proper soil conservation. Mulching around your plants will prevent further erosion and flooding.

Our Idea Proved By Responses Received From The Online Survey.

We first decided to create a Google form for our web application to find out when and why a select number of people turned to it. The results showed that they had started home gardening when the government had closed the entire country during the covid-19 epidemic. This can be explained through our Google form.

It also gave us an idea of how many people are still engaged in gardening and why they are stopping it. Also for home gardening people wanted to know how to get the advice they need and the data they need to help with the cultivation.

Results of Google form

- Are you doing gardening?

  Yes – 53%
  No – 30%
  Maybe – 17%

- When did you start gardening?

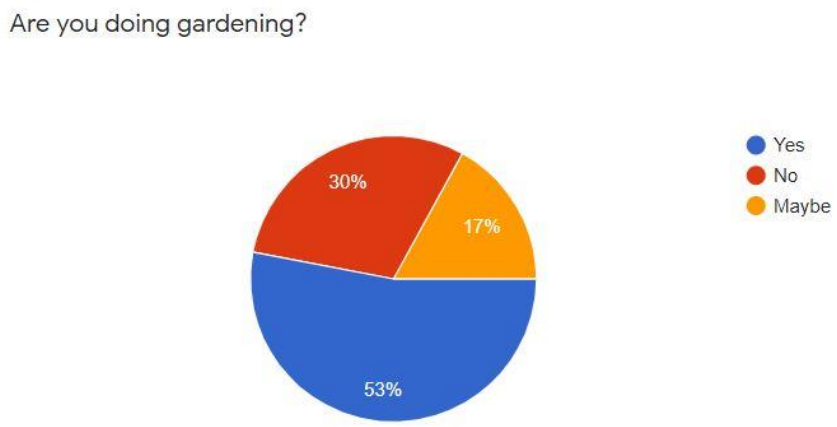

Figure 1. Google Form - Question 1

At the time of lockdown – 40%
Way before lockdown – 60%

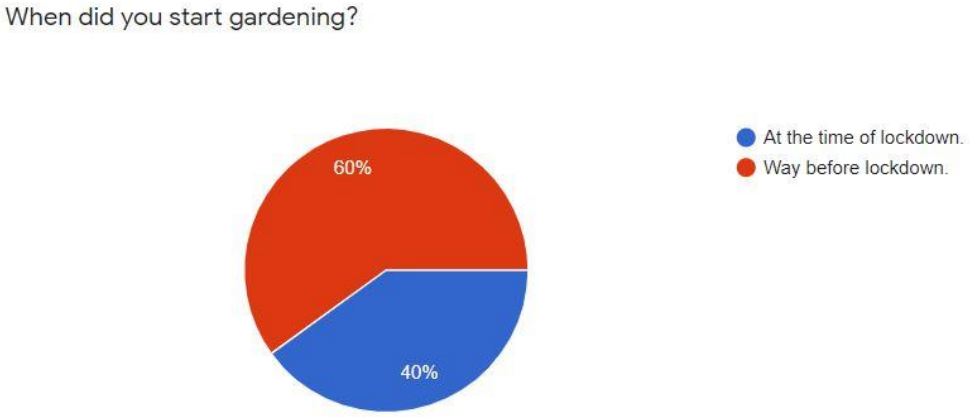

Figure 2. Google Form - Question 2

- If the answer to the second question is YES, what have you plant mostly in your garden? (Multiple answers are allowed)

  Flowers – 53.3%
  Fruits – 41.3%
  Vegetables – 65.3%
  Herbs – 28%
  Green leaves – 40%
  Others – 10.4%

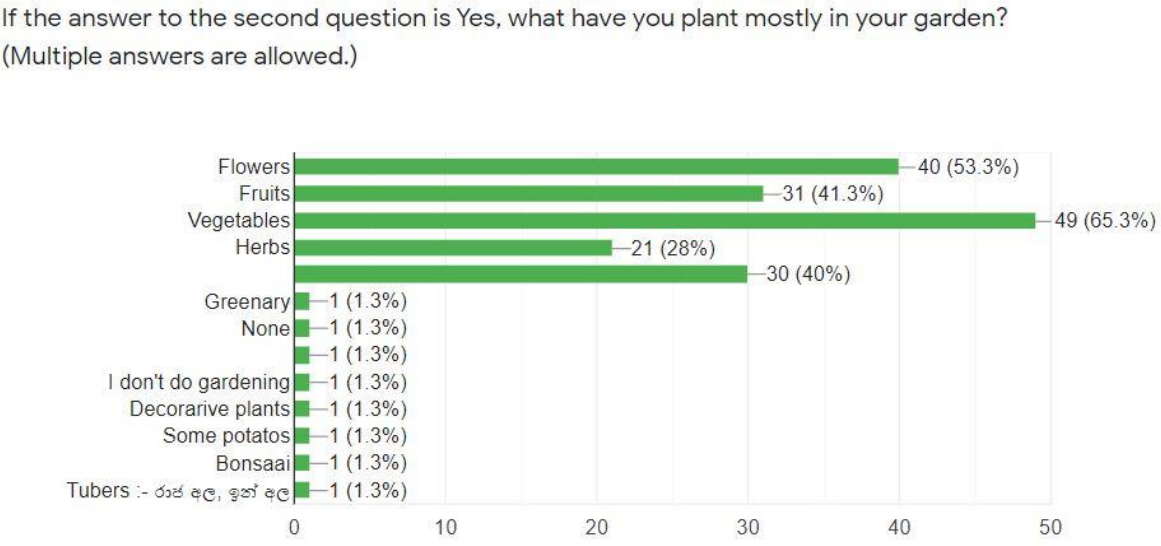

Figure 3.Google Form - Question 3

- If the answer to the second question is No, what are the reasons for it? (Multiple answers are allowed)

  No time. Too busy – 33.3%
  Not interested – 63.6%
  Do not have the required knowledge – 18.2%
  Do not have resources – 12.1%
  Other – 6%

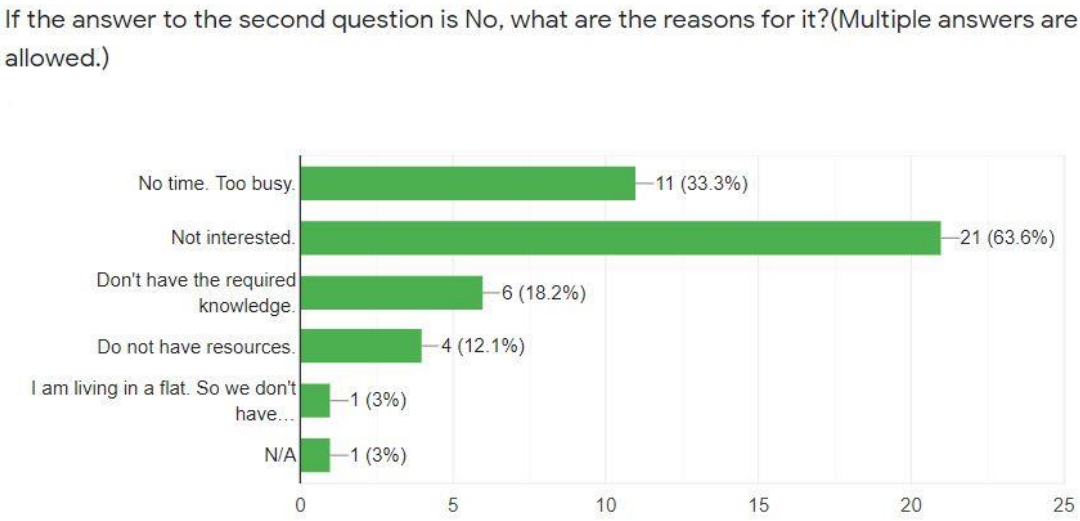

Figure 4. Google Form - Question 4

- Are you still doing gardening?

  Yes – 57.5%
  No – 42.5%

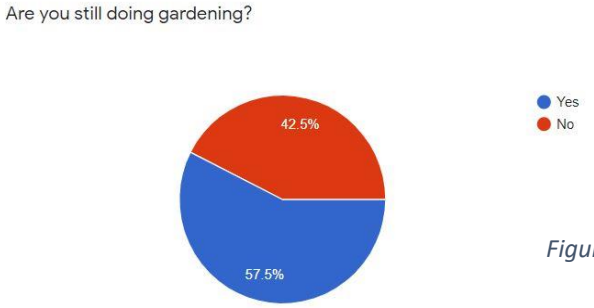

Figure 6

Figure 5. Google Form - Question 4

- What are the problems you faced while you do plantation? (Multiple answers are allowed)

  Financial Problems –7%
  Bugs attacks – 71.8%
  Less fertilizers and chemicals – 25.4%
  Fungus and bacterial infections – 66.2%
  Other – 4.2%

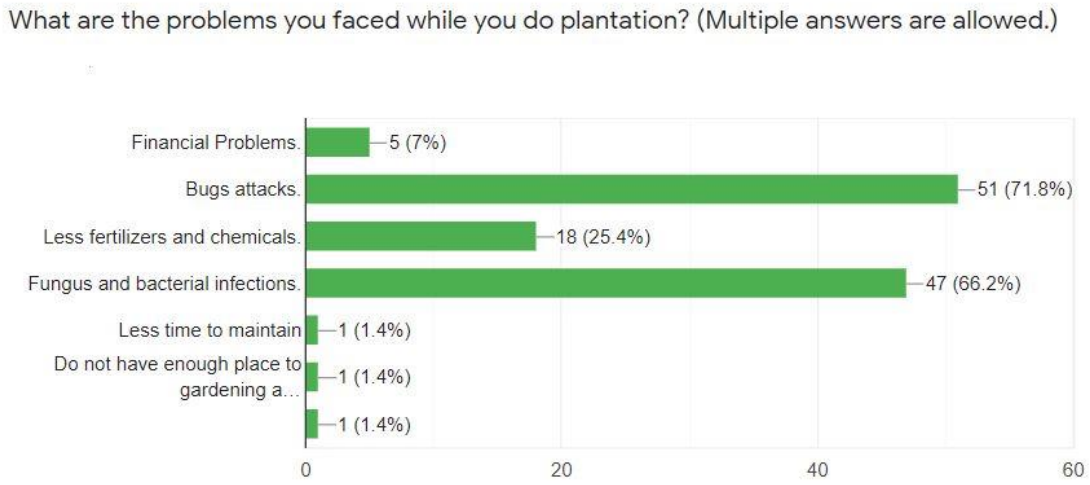

Figure 7. Google Form - Question 5

- How do you find answers to them normally?

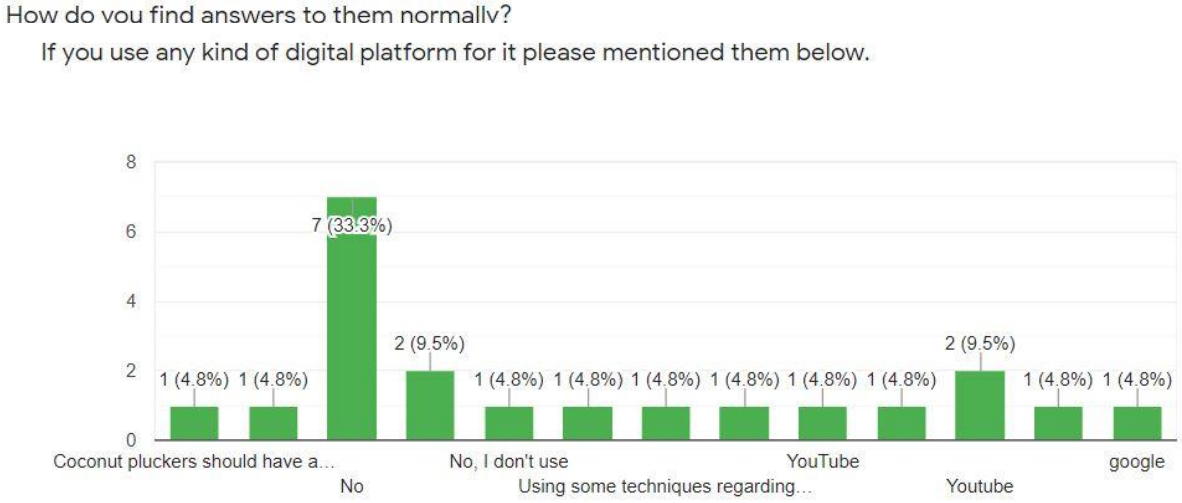

Figure 9. Google Form - Question 7

- If you use any kind of digital platform for it please mentioned them below.

- Would you like to have a guiding web site for this not only to continue from where you stop but to start as a beginner and find solutions for the plantation problems you face?

  Yes – 62.5%
  No – 11.5%
  Maybe – 26%

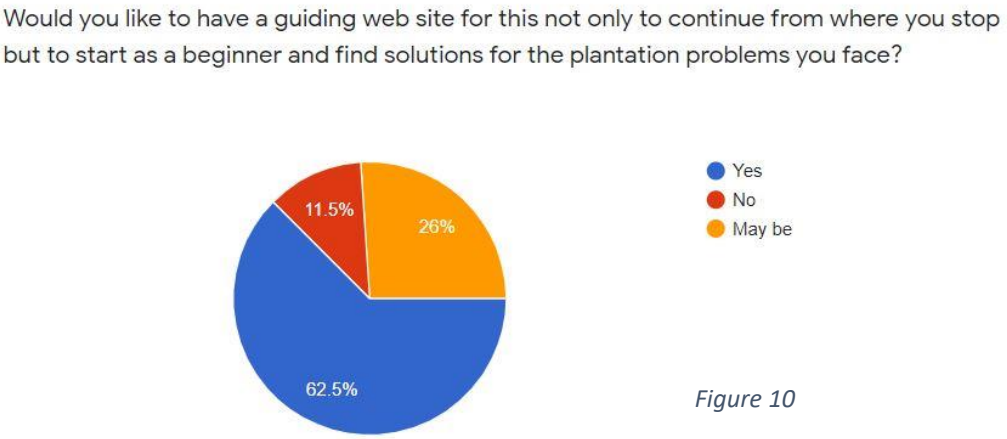

Figure 10

Figure 11. Google Form - Question 8

Research Gap Of The Project.

As Our Web Application's Main Purpose Is To Guide People On How To Start Growing & Maintaining The Selected Plant Type According To Their Favourable Selection, We Have Started Researching On Few Major Sectors Which Are Directly Affected In Plantation.
We Have Reserved A Considerable Space To Collect The Data On The Climate Versatility Of Every Location In The Country As Cultivation & Agriculture Mainly Depend On The Geographical Location & Climate Difference.

We Have Separated The Provinces & Districts In The Country Accordingly To Clarifying The Geographical Difference In The Locations. Although The Climate Difference Of Each & Every Districts Been Collected From Considering The Zonal Clarification Reports Given By The Department Of Weather In Sri Lanka According To The Annual Rainfall & Height From The Sea Level. Detailed Explanations & Respective Example Data Sets Can Be Found In Coming Pages.

There Are Two Core Functional Purposes On This Web Application Regarding The Home Gardening Sector.

- One Major Functional Output Of This Web Application Will Be The Beginner To Professional Level Guidance On How To Initiate On Planting A Short Term Crop & Carry The Maintenance Of The Plant Until It Produces A Good Harvest.
- Second Functionality Of This Web Application Is The Open Source Quick Guidance For Over Coming The Threats Affected Into The Both Home & High Capacity Cultivation.
- In This Functionality, Web Application Serves To Any Random User Who Seeks Guidance For Overcoming The Threats Appeared In To Their Crops By Suggesting The Expertise Strategies From New Industry Treatments For Plants.

The Main Reason To Select Home Gardening For Guidance In Our Web Application Is The Recent Lockdown. Considerable Amount Of People Have Faced So Much Difficulties On Managing Their Daily Consumption Of Food Even Some Of Them Had Money As They Couldn't Reach To The Shops To Purchase. That's Why We Have Put On A Heavy Percentage From Our Research To Collecting Details Of Commercial Plants That Can Be Grown In Home Gardens. Because When There Is Another Emergency Comes Up Like This In The Future, People At Least Have The Chance Of Surviving By Not Depending On Shopping Places.
Therefore, We Will Feature The Short Term Crops Such As Vegetables, Fruits & Herbs That Can Be Grown In A Home Garden. Also We Have Researched On Commercial Flower Plants That Can Be Grown In A Home Environment As An Additional Feature.

In Order To Collect The Data To Our Guiding Web Application On The Modern Home Gardening Sector, We Have Mainly Started Gathering Data Sets On Following Dimensions.

1. Locations Of The Country According To The Provinces & Districts.
    - Separated By Geographical Zone(Dry, Wet , Intermediate)
    - Separated By Climate Seasons(Monsoonal)

2. Annual Rainfall Of Each Location In The Country(2018-2019)
3. Height From The Sea Level(Which Affects The Plant Growth)
4. Major Short Term Crops We Will Feature On Web Application.
    - Vegetables, Fruits, Herbal Plants, Flowers
5. Harvesting & Cultivation Productivity Records Within Last Five Years In Sri Lanka(2015-2019).
6. Records Of The Destructed Amount Of Plants Within Last Five Years In Sri Lanka(2015 - 2019)
    - To Suggest The Prevention Strategies For Sicknesses & Bug Attacks On Short Term Crops.
7. The Suitability Of Soil For Plantation In Several Locations In The Country.

Locations Of The Country According To The Provinces & Districts.

Complete Sri Lankan Island Is Divided Into Nine Main Provinces & 25 Districts According To The Geographical Location. It's Also Divided Into 3 Major Zones By Considering The Annual Rainfall. This Clarification Is The Most Important Out Of All When It Specially Comes To Agricultural Statistics In The Country. This Is More Important To Our Web Application As It Mainly Calculates The Suitability Of Cultivating New Plants In A Home Garden According To The Residence Location Given By The User. Location Will Filter Through Our Compatibility Database & Suggest The Best Plants To Grow In Considered Location.

Dry Zone	Wet Zone	Intermediate Zone
Jaffna	Kurunegala	Kandy
Kilinochchi	Matale	Kegalle
Mullathiv	Badulla	Nuwara Eliya
Vavuniya	Hambantota	Gampaha
Trincomalee		Colombo
Anuradhapura		Kalutara
Polonnaruwa		Galle
Batticaloa		Matara
Ampara		Ratnapura
Monaragala		

Figure 12. Zonal Diversification Of Sri Lanka

Provincial & District Wise Clarifications Is Specially Using To Find The Most Suitable Place To Grow The Picked Plants By User More Accurately. That's Why The Data Sets has Been Collected On Geographical Locations Going To Be Filtered With The Data Set Of Best Plants Can Be Grown In A Sri Lankan Home Garden & Suggest The User With The Best Possible Ways To Initiate On Planting Them.

According To The Weather Department Of Sri Lanka, The Country Has Four Main Climate Season For Planting & Agriculture. This Was Calculated According To The Annual Rainfall Of The Island.

- First Inter-Monsoon Season - January, February, March, April
- South-West Monsoon Season - May, June,
- Second Inter-Monsson Season - July, August, September, October
- North-East Monsson Season - November, December

Many Commercial Plants In The Country Is Mainly Cultivating By Considering The Monsoonal Seasons Given Above. The Reason Is Rainfall. Because Commercial Plantings Like Paddy & Wheat Constantly Needs Water Supply. So Farmers Mainly Considering The Rainfall By Cultivating Their Crops According To The Monsoonal Seasons. This Prediction System Has Not Been Used To Predict The Plant Growth For Home Gardening Sector. We Have Collected The Data Sets On How several Plant Growths React To The Monsoonal Seasons & We Will Be Using It As A Special Part In Creating Our Guiding Web App's Suggestion Functionality.

Annual Rainfall Of Each Location In The Country.(2017-2019)

Data Sets Regarding The Annual Rainfall For Each & Every District In The Country Been Collected Find Which Districts Are Receiving High & Less Amount Of Rain Throughout The Year. This Data Set Gives Us A Proper Idea Of Suggesting The Users About The Amount Of Water They Should Supply Manually To Their Crops. The Locations That Receiving Considerable Amount Of Rainfall Throughout The Year Won't Be Needing To Supply Extra Amount Of Water As Well As The Locations That Receiving Less Amount Of Rain Throughout The Year Will Be Needing To Supply Water Manually To Their Crops. The Format We Collected The Data Is Shown Below In An Example.

Annual Rainfall, Average Temperature, Average Wind Speed Chart Sri Lanka(2017)			
District	**Annual Rainfall(mm)**	**Average Temperature(C)**	**Wind Speed(Km/Hr)**
Kurunegala	154.0	25.1	6.5
Badulla	206.2	22.3	7.1
Ratnapura	112.1	30.0	5.5
Monaragala	161.4	28.2	5.9
Nuwara Eliya	297.3	20.1	6.9
Matara	131.3	29.9	5.6
Ampara	186.5	27.9	4.9

Figure 13. Annual Rainfall Of Sri Lanka (2017)

Annual Rainfall, Average Temperature, Average Wind Speed Chart Sri Lanka(2018)			
District	**Annual Rainfall(mm)**	**Average Temperature(C)**	**Wind Speed(Km/Hr)**
Kurunegala	158.0	26.2	6.9
Badulla	209.6	22.7	7.2
Ratnapura	112.9	31.1	5.4
Monaragala	162.5	29.4	6.0
Nuwara Eliya	289.8	21.8	6.6
Matara	129.5	31.0	5.8
Ampara	190.2	29.1	5.1

Figure 14. Annual Rainfall Of Sri Lanka(2018)

Height From The Sea Level Of All The Districts.

Considering Location's Height from the Sea Level Is another Most Important Factor We Found While We're Researching Planting Suitability Data Sets. Because Many Short Term Crops We're Going Feature In Our Web Application Reacts To The Location's Height From It's

Growing Speed. Some Plants Are Suitable To Grow In Lower Ground Level & Some Are In Higher Ground Levels. We Have Put Some Examples In Below Table.

District	Height From Sea Level(Meters)	Suitable Plants To Grow
Galle	500m	Chilli, Tomato
Kurunegala	750m	Brinjol, Pumpkin
Badulla	1200m	Leeks, Carrot
Monaragala	800m	Radish. Plate Brush
Kandy	1000m	Bitter Gourd, Durian
Mullathiv	500m	Capsicum, Beet
Batticaloa	700m	Ridged Gourd, Cucumber

Figure 15. Height From The Sea Level Of Few Districts

Major Short Term Crops We Will Feature On The Web Application.

1. **Vegetables** – We Have Mainly Focused On To Feature The Vegetable Types Which Can Produce Harvest In A Short Period. But This Web Application Also Gives Guidance To Considerable Amount Of Long Term Vegetables Planting In Sri Lanka As Well. If Any Vegetable Plant Lasts For 60 Days Of Time Since The Day It's Planted, Web Application Suggests People On Maintenance Strategies To Output A Prolific Harvest Since The Day Itself.

2. **Fruits** – Most Fruit Types Taking Around 5-6 Months To Produce It's Harvest After The Plantation. As The Web Application Mainly Focused On Home Gardening Sector. We Have Researched On Choosing The Suitable Fruit Plants To Grow In A Home Garden Environment. Fruit Plants Need More Maintenance Guidance As The Plants Last For A Long Time & Several Natural Threats & Bug Attacks Are Causing. So We Collected Data On How To Solve These Problems By Natural Treatments.

3. **Herbal Plants** - Sri Lanka Has A Variety Of Herbal Plant Types & Spices That Grow In Home Gardens For Conceiving The Domestic Need. Herbal Are Using As Treatments For Smaller Diseases & Spices Are Using To Make The Food Much Delicious. So, We Launched Our Research To Collect Data Sets About The Herbal Plants & Spices Can Be Grown In A Home Environment.

4. **Flowers** – Considerable Percentage Of People In Sri Lanka Does Flower Planting In Their Gardens Specially Including House Wives. Some Of Them Have Does It For Personal Favour As Well As Some Are Doing It For Commercial Purposes. It's Hard To Maintain Flower Plants Without Proper Treatments & Guidance. Our Web Application Reserved A Special Position For Guiding On How To Plant Commercial Flower Plants As Well.

Main Plant Types Which Will Feature On Our Web Application			
Vegetables	**Fruits**	**Herbal Plants**	**Flowers**
Carrot	Mango	Kathurumurunga	Anthurium
Leeks	Pine Apple	Thumba	Gerbera
Cabbage	Dragon Fruit	Gotukola	Alstromeria
Cauliflower	Wood Apple	Kohila	Chrysanthemum
Ridged Gourd	Banana	Anguna	Orchid
Cucumber	Fashion Fruit	Niviti	Roses
Snake Gourd	Guava	Akkapana	Butterfly Pea
Salad Leaves	Avocado	Neeramulliya	Lanatana
Chilli	Watermelon	Sarana	Hibiscus
Capsicum	Grapes	Thebu	Jasmine
Brinjal	Rambutan	Japan Batu	Kadupul

Figure 16. Major Short Term Crops In Sri Lanka

Harvesting & Cultivation Productivity Records Within The Last Five Years In Sri Lanka(2015-2019)

Harvesting & Cultivation Productivity Records Are Crucial To Our Web Application As We Are Specially Adding A Functionality To Automatically Predict The Output Of Grown Plants In Their Home Gardens.

By Simple Form, This Functionality Gives Users The Ability To Measure How Many Resources They Have Invest On Getting The Best Outcome.

Example: Amount Of Space Needs To Reserve For One Plant Type In Their Garden
How Many Seeds They Have To Plant
Amount Of Fertilizers They Need To Use For The Crop.

All The Conversions Will Be Taking From The Average Productivity Records.

Year	District	Cultivation Extent(Ha.)	Annual Production(Mt.)	Export(Ha.)
2015	Ratnapura	1156.16	1258.84	316.6
2016	Ratnapura	1159.28	4309.40	920.85
2017	Ratnapura	1380.43	3899.43	1003.58
2018	Ratnapura	1423.39	3600.31	1223.46
2019	Ratnapura	1446.61	3719.48	1380.50

Figure 17. Ratnapura District Annual Agricultural Productivity Records

Year	District	Cultivation Extent(Ha.)	Annual Production(Mt.)	Export(Ha.)
2015	Badulla	335.32	2063.28	436.11
2016	Badulla	313.49	2225.37	580.42
2017	Badulla	320.03	2778.59	800.34
2018	Badulla	329.43	2780.48	812.54
2019	Badulla	342.34	2995.38	930.61

Figure 18. Badulla District Annual Harvesting Productivity Records

Records Of The Destructed Amount Of Plants Within Last Five Years In Sri Lanka(2015-2019)

Considerable Amount Of Short Term Plants Are Destructing From The Bug Attacks & Natural Causes. The Reason Why We Collected This Data Set To Find Out What Diseases Are Causing To Each & Every Crop. This Helps To Find The Solutions To Overcome This By Using The Chemical Treatments & More Prevention Strategies.

Year	Crop	Bug Attacks(%)	Bacteria & Fungus Infections(%)	Lack Of Fertilizers(%)	Animal Attacks(%)
2015	Pumpkin	2.33	1.36	1.21	0.31
2016	Pumpkin	2.41	0.89	1.49	0.36
2017	Pumpkin	1.89	0.76	1.44	0.29
2018	Pumpkin	2.39	0.94	1.51	0.33
2019	Pumpkin	2.56	0.71	1.12	0.41

Figure 19. Destructed Amount Of Pumpkin Plants Within Last Five Years

Year	Crop	Bug Attacks(%)	Bacteria & Fungus Infections(%)	Lack Of Fertilizers(%)	Animal Attacks(%)
2015	Cucumber	1.83	1.01	1.88	0.34
2016	Cucumber	1.91	0.91	1.97	0.41
2017	Cucumber	1.95	1.04	1.95	0.39
2018	Cucumber	1.76	1.31	1.42	0.38
2019	Cucumber	1.89	0.97	1.51	0.40

Figure 20. Destructed Amount Of Cucumber Plants Within Last Five Years

The Suitability Of Soil For Plantation.

The Suitability Of Soil Is Very Important To Plantation As The Growth Rate & Quality Of The Grown Plant & Matured Harvest Fully Depends On It. Department Of Agriculture In Sri Lanka Have Produced A Detailed Chart On Soil Quality For Cultivation In Sri Lanka. We Have Collected It & Clarified It Again According To The Locations We Have Divided In District From. In This Data Set, We Can Measure Which Sort Of Soil Belongs To Respective Districts & Suggest The Best Growing Plants To The Users On Those Conditions.

District	Zone Belongs To	Soil Type	Suitable Plants.
Nuwara Eliya	Intermediate Zone	RYP, RBE, LHG	Leeks, Cucumber
Kurunegala	Wet Zone	RBL, Regosol	Cashew, Durian
Badulla	Wet Zone	RYP, Mountain Regosol	Biiter Gourd, Ridged Gourd
Ampara	Dry Zone	RBE, LHG, NCB	Brinjal, Pumpking
Monaragala	Dry Zone	Alluvial, Grumusol	Cabbage, Radish

Figure 21. The Quality Of Soil In Several Districts In Sri Lanka

RYP – Red Yellow Podzollic Soil
LHG – Low Humeic Gley Soil
NCB – Non-Calcic Brown Soil
RBE – Reddish Brown Earth

Aim Of The Project

With the current situation in the country we thought farming on our own and having some food as backup would be useful for people. But the question that the most of them having is. How?

How to do it? How to plant on our own? What type of weed we should? What kind of weather does it require? What is the time/season that suits for that particular plant? Those are the questions that people have when it comes to planting on their own.

We as a team willing to make a place that people can have answers for all the questions above easily. We are planning to offer all this information for the people who actually need it.

Who needs it?

Here in our site we mainly focusing on Farmers, Housewives, Elders, and Professional level people who do farming. We are mainly focusing on those people because we believe that they need it the most. We are willing to provide all the help need including the types of plants they can select according to their living location or target planting location, we are planning to provide all the details about what are the types of fertilizers that they should use and what is the actual suitable weather that they should start growing that plant.

We as a team came up with one conclusion that we are going to make a website for this purpose. We could be able to find many similar websites that give you answers for the few of those questions. But we are planning to give all the answers you need in our site. We are going to widen our database of plants, and we are currently having around 60 plants and in future we are planning to make it hundreds or thousands if it is possible.

Why is it different from other web sites?

Our main strategy here is guiding the people who actually love it. We believe that we can actually do something better than the other websites. Because we are looking up to have a sector for predicting the plant growth.

Basically we are planning to give people a hobby more profitable one. We are going to challenge our people to grow something on their own. We are going to help them with that profitable hobby because of the current pandemic we don’t know when they will lock down the country again it might not have to be a lock down, let’s assume your city or your village is under curfew then you would be able to consume the food you have grown on their own home with our help.

Farmers Unity

When people start using our website they will start getting more questions. Maybe someone would know something we don't know. We are planning to install a forum for everyone that use our website. Where you can simply enter your e-mail and name and your question it can be either subject based or a technical issue we would provide the support needed. Therefore, thanks to this forum facility we hope people will look up to interact with each other and share their knowledge with us.

How this helps you?

When it comes to farming issues people always have to either depend on agricultural ministry or any other physical place to get help on their planting problem. But we are going hoping to change that system make things happen virtually. You don't have to wait in long lines. You don't have to spend a lot of energy just to find answers for your questions .We are going to help you with all your farming problems virtually. If you are a grower or a farmer or a housewife or if you are a human who is simply trying to get some knowledge about the plant that you are going to grow then we are ready to help.

We are going to make this site bigger and better the more you help us. If the people are interested in our site we are looking forward to extend our capacity to high-capacity plantation web application.

Scope Of The Project

In-Scope

Website Type

This website is mainly based on the home gardening sector. It is a guiding website based on data science. The website will guide the users to do home plantation most accurately. From Seed planting to the harvest day the essential needs such as watering, fertilizing, disease control, insect attack remedies are all guided in this website. Apart from these, the software will give information about the current market values if the users wish to do gardening for business purposes. Furthermore, this website will allow the users to add their comments, their knowledge about the plantation, and new trends in the plantation by including a blog page.

Goals

Our main goal is to improve home gardening, motivate people to implement home gardening, and offer more knowledge about home gardening. During the current pandemic situation, many people started home gardening. But most people gave up home gardening as they don't have the required knowledge to maintain it for the long term. Especially, reasons such as insect attacks, sicknesses, and preserving problems (fertilizer, water). Hence, on this website, we plan to give the required solutions to the problems that people face in home gardening and guide them throughout the period. According to our researches, many people state that they don’t have time to do gardening as most people think gardening is time-consuming. This is a major problem to lose motivation. But from this software, the website will guide the user every day and it will provide information on what should be done on that particular day. This will take less time as it will give specific information about what should be done on that specific day. In this way, it is easy for people and it can be implemented as a long-term hobby. Furthermore, this guiding website will help people to reduce their living expenses by planting basic edible plants such as vegetables, fruits, etc.

Objectives

Our objectives for this website are to guide the beginners (beginners to home gardening) by giving them the required knowledge about how to maintain a plant and guide them from the beginning to the end. (day 1 to harvest day). This will motivate new people to attempt home gardening as they have the website to guide them in the correct pathway. Furthermore, when plants caught up with various diseases a lot of people halt gardening as they lose their motivation because the majority of people don’t know the essential remedies for the specific disease. Apart from this problem many individuals don’t know the plants that are most suitable for gardening based on the area that they live. Sri Lanka is a country which has diverse climates that is different for each district. Hence, our website will guide the users to plant the most suitable plant based on the place that he or she lives by analyzing data. By doing home gardening, it will be a support to the expenses as people can eat the edible harvest as well as can sell the excess harvest. Currently, apart from edible plants, people tend to plant flowering plants too. Our website also supports planting floral plants as well as green leaves and herbs. In this platform, people can exchange new information on home gardening and try new trends.

Target Audience

Our target users for this website are users within the age limit of twenty and above. We plan to create our website in a way that every person (without an age limit) can easily operate it without complicated functions. According to our researches, it confirms that most elders are keener to do home gardening. Most elders don't have the required practical knowledge to operate new technical devices. Hence, a website will not be a good idea for them. This will significantly influence our website architecture. Therefore, we will design our website in an impressive way to give the audience a good first impression and create the functions in the simplest way in a way that everybody can understand without complications.

Data Sets

Our data sets consist of data of vegetables, fruits, green leaves, disease control, productivity, and expenses. For each plant, the suitable climates (height from sea levels, soil types, and Ph values), plant varieties, suitable districts to grow, seed requirements, land preparations, suitable month to plant, and days till the harvest are all recorded in the data sets. When the user inputs the information to the system it will analyze these data and will offer the most suitable plant to the user for home gardening at that time period (for beginners). Furthermore, for every plant, required fertilizers, diseases that each plant can face, and treatment for diseases are recorded. These data will help beginners to maintain their plants as well as, offer solutions when professionals (not beginners) face problems such as diseases and bug attacks. Apart from this, through the data of productivity and expenses, if the user wishes to sell their harvest the website can give information about the income that they will receive based on the expenses from calculating and analyzing with the current market price.

Our message

Sri Lanka is a developing country. Most people still earn their monthly income by doing day to day hired work. During the current pandemic situation, many people lost their jobs and were left helpless as they don't have the money to maintain their families. Some families were forced to be content with only one meal as they don't have any income. Hence, we like to introduce this website to encourage everyone to start home gardening. Since it will help people with food needs as well as money need. Apart from this, most Sri Lankans consume chemical fruits and vegetables. These chemicals are very harmful to the human body. Engaging in home gardening will supply chemical less organic harvest which is very beneficial for the human body. So, we like to introduce a website that is very simple and very effective in every way.

Out of scope

Currently this website is only based on the home gardening sector. But in Sri Lanka, large-scale plants such as paddy, rubber, tea, and coconut are very popular. These plants cultivated areas are very large. We are not creating this website to support these types of the plantation as there is a lot of government influence over them currently. Home gardening is a new trend that got popular during the lockdown period. But large-scale cultivators have a lot of experience in the plantation as they have done it for generations. So, at the present, we are

only prioritizing home gardening as it is a sector that must be improved, but if we have the ability to get the required data about large scale cultivation, we plan to update the website for large scale plantation too.

For this website we like to add a platform where people can communicate with professionals in home gardening. By communicating with professionals, users can be more certain about the information they receive. Furthermore, people tend to like mostly to gain knowledge from videos rather than reading some data. Hence, adding various videos about home gardening can give users more knowledge about planting.

Features Of The Prototype

The features in our web site are very much beneficial to the user, as they are always dealing with the user and the experts constantly when the user starts to use this. Through this features users can maintain their gardens from the day one, until to the day of harvest and after that even if the user desires to do this further more

Blog

The first feature is the blog. The blogs can be written by experts and users. Simply experts can share the new trends and techniques used in gardening and the new researches base on these while users can write down their experiences in gardening after and before using this web site.

And also both parties can write their comments and reviews on the articles published in the vlog. If some kind of misconduct happens in the blog developer can take the necessary actions for it using necessary technologies for it like deleting those type of comments, reviews and blog articles.

To create this component, we are planning to use React Native. It is a multi-platform solution which will run both on the web and mobile using the React Native Web library, which allows you to use React Native components and APIs in web applications.

If someone asks why aren't you'll using Flutter? Well, simply the answer would be this. In comparison with React Native, Flutter loses points to the familiarity of JavaScript, since Flutter uses Dart, a programming language that is rarely utilized by developers. Therefore, we believe that React Native might be a better choice.

The Saving and Filtering of data

The next feature would be the data saving and filtering feature. When the user enters necessary information asked by the web site like the district he or she lives, what are the varieties user wants to plant (fruits or vegetable or flower or all) and if the user already doing some gardening, the system will ask that also to add.

When the user enters the asked data, our system will go through our data sets like the annual rainfall, annual weather and climate patterns and some more. Then our web site will suggest the user what are the most suitable plants that user should plant. Furthermore, when the user

gives the information about the process of the gardening, our web will help the user in using fertilizers and chemicals, prevention and curing the diseases which plants will have, etc.

For this filtering and analyzing data we need an algorithm for it and we are still searching for the most suitable one. Other than that we have over five hundred data sets in CSV format which was shown to one of the lecturers in the Software Development Group Project module when they are in the excel sheets and that lecturer was impressed with our data sets. Besides, we are collecting data from a google form to gather up data from the general people as well and those data will be also included in our web.

Videos of Experts and Interaction with experts

As another Extra feature in our web is that we are adding experts' videos for this as a help for the users. And users also can share the information and experiences as videos(Vlogs) in here. Even though this web site, the users can contact the relevant experts to question them for more guidance.

Feature Comparison Chart

Features that we provide to our users

- Take the user's location and show them what kind of crops are suitable for their area.
- If they want to cultivate a plant which is not that suits with the conditions of their land we suggest the special conditions that user has to afford.
- Continuous guidance until the harvest day - we guide the farmer continuously from the planting day to harvesting day.
- Take the user's size of the land and show them how much harvest that they can earn from it.
- If the farmer wants to improve the harvest of their land we give the guidance that they have to follow.
- User can ask any relevant problems and we give them the answers.
    - Ex: They can ask about a disease that is killing their harvest, and the solution for it
- The forum – users can communicate and share informations about their farming, harvesting, crop's diseases and insect's problems like relevant issues through the app.
- The blog – we use this to share new agricultural trendings with our users to keep them update with the agriculture.

There are lot of apps for the farming field but most of them hadn't done a great job at it. So, We chose three apps to compare with our application to prove that our application is more user friendly and helpful than others.

Figure 24. Krushi Upadeshaka - Mobile Application

Figure 23. Agri App - Mobile Application

Figure 22. Govi Mithuru - Mobile Application

1. *Krushi Advisor – This app is designed by the Department of Agriculture in Sri Lanka. The target group of this mobile app considers farmers, agriculture entrepreneurs,*

students and other agriculture information seeking stakeholders. This app provides agricultural advisory services for food crops cultivation in Sri Lanka.

Feature	Krushi Upadeshaka	Our Web Application
Taking user's location and showing them suitable plants	✗	✓
chosen plant is not that suitable with the conditions of the area but app give suitable advices to successfully plant it.	✓	✓
Continuous guidance until the harvest day	✗	✓
Calculate and show the amount of harvest user can earn from the size of their land.	✗	✓
Guide the user to improve the harvest of their land.	✗	✓
User can ask any relevant problems and we give them the answers.	✓	✓
The forum	✗	✓
The blog	✗	✓

Figure 25. Feature Comparison - Krushi Upadeshaka

Figure 28. Krushi Upadeshaka - Plant Types

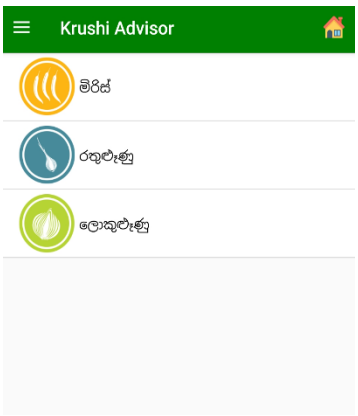

Figure 27. Krushi Upadeshaka - Plants

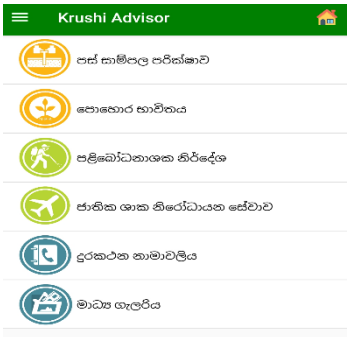

Figure 26. Krushi Upadeshaka - Utilities

2. *AgriApp – this application provides complete information on crop production, crop protection, smart farming with agriculture and allied services. AgriApp is also an online market place for bringing in farmers, Agri input, retailors and fulfilment services on a common digital platform.*

Feature	AgriApp	Our Web Application
Taking user's location and showing them suitable plants	✗	✓
chosen plant is not that suitable with the conditions of the area but app give suitable advices to successfully plant it.	✓	✓
Continuous guidance until the harvest day	✗	✓
Calculate and show the amount of harvest user can earn from the size of their land.	✗	✓
Guide the user to improve the harvest of their land.	✗	✓
User can ask any relevant problems and we give them the answers.	✓	✓
The forum	✓	✓
The blog	✓	✓

Figure 29. Feature Comparison - AgriApp

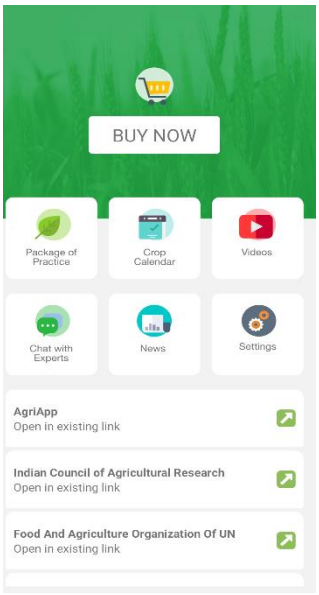

Figure 31. AgriApp Cart

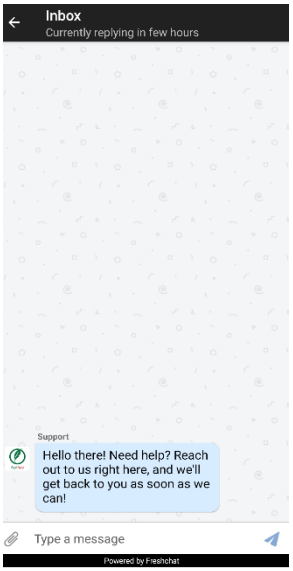

Figure 30. AgriApp Notifications

Figure 32. Agri App - Utilities

3. *Govimithuru – This Application's Content Is Mainly Provided By The Department Of Agriculture, Sri Lanka. Information Is Provided To Home Gardeners. Customized As Per Farmer's Need.*

Feature	Govimithuru	Our Web Application
Taking user's location and showing them suitable plants	✓	✓
chosen plant is not that suitable with the conditions of the area but app give suitable advices to successfully plant it.	✓	✓
Continuous guidance until the harvest day	✗	✓
Calculate and show the amount of harvest user can earn from the size of their land.	✗	✓
Guide the user to improve the harvest of their land.	✗	✓
User can ask any relevant problems and we give them the answers.	✓	✓
The forum	✗	✓
The blog	✗	✓

Figure 33 Feature Comparison - GiviMithuru App

Figure 36. GoviMithuru Information Centre

Figure 34. GoviMithuru Gallery

Figure 35. GoviMithuru Utilities

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Appendix

The Table Given Below Shows How Our Group Members Contributed On Making Of The Project Proposal Report.

Topic	**Member Name**	**UOW ID**
Problem Background	Chanka Sonnadara	W1790805
Research Gap	Amila Fernando	W1761914
Aim	Ashen Induwara	W1761741
Scope	Rushelle Clement	W1790166
Features Of Prototype	Ranma Perera	W1790164
Feature Comparison Chart	Naduni Kaveesha	W1790036