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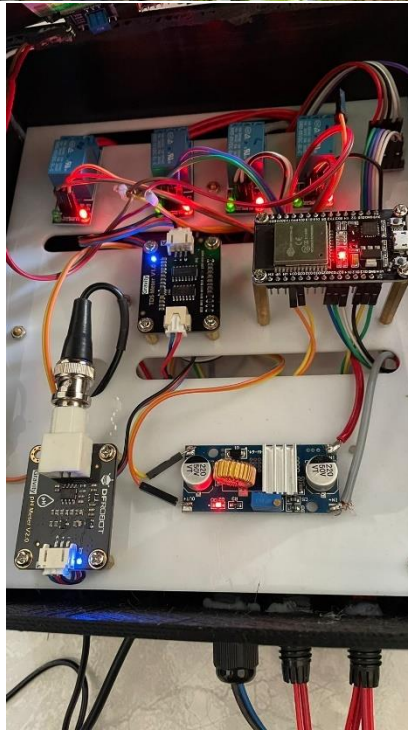
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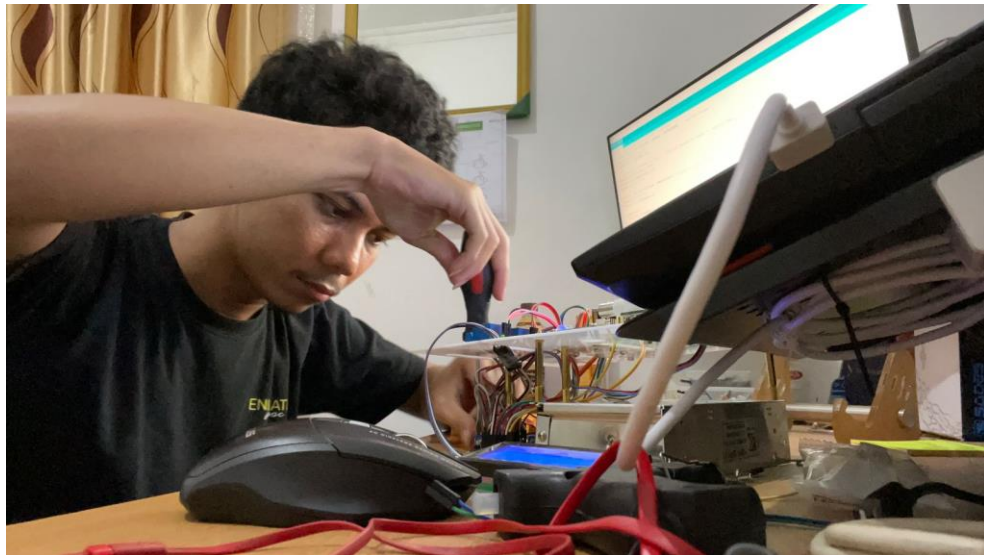
LAMPIRAN

Lampiran 1 Dokumentasi alat





Lampiran 2 Dokumentasi pembuatan alat dan pengambilan data







Lampiran 3 Data pembacaan sensor

Time	Lux Meter	pH Meter	TDS Meter
06/04/2023 12:00 AM	17,85	6,25	756
06/03/2023 11:00 PM	20	6,26	755,76
06/03/2023 10:00 PM	21,22	6,27	756,87
06/03/2023 09:00 PM	22,33	6,28	756,17
06/03/2023 08:00 PM	22,49	6,29	756,12
06/03/2023 07:00 PM	22,46	6,29	756,1
06/03/2023 06:00 PM	22,96	6,31	758,3
06/03/2023 05:00 PM	161,36	6,31	753,03
06/03/2023 04:00 PM	457,49	6,34	753,9
06/03/2023 03:00 PM	702,2	6,32	755,31
06/03/2023 02:00 PM	606,03	6,33	755,41
06/03/2023 01:00 PM	1026,63	6,35	757,5
06/03/2023 12:00 PM	1200,79	6,37	756,1
06/03/2023 11:00 AM	1460,17	6,37	756,57
06/03/2023 10:00 AM	1591,72	6,38	758,45
06/03/2023 07:00 AM	165,83	6,39	762,46
06/03/2023 06:00 AM	102,85	6,4	763,46
06/03/2023 05:00 AM	14,6	6,41	763,55
06/03/2023 04:00 AM	14,17	6,43	753,63
06/03/2023 03:00 AM	14,17	6,46	756,87
06/03/2023 02:00 AM	14,17	6,49	759,24
06/03/2023 01:00 AM	14,17	6,51	760,11
06/03/2023 12:00 AM	14,17	6,51	761,6
06/02/2023 11:00 PM	14,17	6,52	762,22
06/02/2023 10:00 PM	14,42	6,53	763,06
06/02/2023 09:00 PM	14,54	6,55	752,99
06/02/2023 08:00 PM	14,18	6,56	757,6
06/02/2023 07:00 PM	14,17	6,56	759,44
06/02/2023 06:00 PM	11,59	6,57	760,05
06/02/2023 05:00 PM	69,66	6,58	764,32
06/02/2023 04:00 PM	295,46	6,59	765,79
06/02/2023 03:00 PM	793,08	6,6	763,42
06/02/2023 02:00 PM	906,86	6,61	751,05
06/02/2023 01:00 PM	799,35	6,62	753,17
06/02/2023 12:00 PM	840,17	6,63	757,55
06/02/2023 11:00 AM	1319,48	6,64	754,3
06/02/2023 10:00 AM	2271,28	6,64	755,82
06/02/2023 09:00 AM	4683,79	6,67	757,46
06/02/2023 08:00 AM	793,68	6,68	758,01

Time	Lux Meter	pH Meter	TDS Meter
06/02/2023 07:00 AM	329,37	6,69	759,79
06/02/2023 06:00 AM	66,86	6,71	759,34
06/02/2023 05:00 AM	15,42	6,71	760,86
06/02/2023 04:00 AM	14,89	6,73	760,37
06/02/2023 03:00 AM	14,95	6,74	761,27
06/02/2023 02:00 AM	14,99	6,75	761,36
06/02/2023 01:00 AM	15	6,76	761,97
06/02/2023 12:00 AM	15,01	6,77	762,97
06/01/2023 11:00 PM	15,82	6,78	752,59
06/01/2023 10:00 PM	15,97	6,79	753,27
06/01/2023 09:00 PM	15,68	6,81	754,41
06/01/2023 08:00 PM	14,42	6,82	755,17
06/01/2023 07:00 PM	15,99	6,83	757
06/01/2023 06:00 PM	17,11	6,84	757,95
06/01/2023 05:00 PM	210,21	6,84	759,7
06/01/2023 04:00 PM	576,24	6,85	760,14
06/01/2023 03:00 PM	675,51	6,83	760,28
06/01/2023 02:00 PM	968,73	5,53	759,41
06/01/2023 01:00 PM	799,98	5,54	752,33
06/01/2023 12:00 PM	995,34	5,56	756,92
06/01/2023 11:00 AM	1422,49	5,57	760,46
06/01/2023 10:00 AM	1924,16	5,58	761,75
06/01/2023 09:00 AM	15029,69	5,59	761,69
06/01/2023 08:00 AM	1797,42	5,59	763,31
06/01/2023 07:00 AM	956,73	5,6	752,26
06/01/2023 06:00 AM	232,18	5,62	752,04
06/01/2023 05:00 AM	18,17	5,63	753,75
06/01/2023 04:00 AM	17,98	5,64	753,16
06/01/2023 03:00 AM	18,29	5,65	756,7
06/01/2023 02:00 AM	18,27	5,65	759,18
06/01/2023 01:00 AM	18,25	5,66	761,69
06/01/2023 12:00 AM	18,05	5,67	761,84
05/31/23 11:00:00 PM	18,1	5,68	752,18
05/31/23 10:00:00 PM	18,07	5,7	756,54
05/31/23 09:00:00 PM	17,9	5,7	757,03
05/31/23 08:00:00 PM	17,89	5,71	753,44
05/31/23 07:00:00 PM	17,72	5,72	755,48
05/31/23 06:00:00 PM	16,9	5,73	757,87
05/31/23 05:00:00 PM	99,1	5,74	759,53
05/31/23 04:00:00 PM	339,94	5,75	759,92

Time	Lux Meter	pH Meter	TDS Meter
05/31/23 03:00:00 PM	904,95	5,76	759,04
05/31/23 02:00:00 PM	939,25	5,77	751,74
05/31/23 01:00:00 PM	734,62	5,8	755,99
05/31/23 12:00:00 PM	982,77	5,81	755,29
05/31/23 11:00:00 AM	1135,07	5,82	756,92
05/31/23 10:00:00 AM	2216,42	5,82	757,26
05/31/23 09:00:00 AM	16110,11	5,83	758,98
05/31/23 08:00:00 AM	1211,84	5,84	760,44
05/31/23 07:00:00 AM	351,36	5,85	762,56
05/31/23 06:00:00 AM	71,89	5,86	761,74
05/31/23 05:00:00 AM	17,12	5,88	761,22
05/31/23 04:00:00 AM	17,36	5,89	751,33
05/31/23 03:00:00 AM	17,49	5,91	753,18
05/31/23 02:00:00 AM	17,5	5,92	754,97
05/31/23 01:00:00 AM	17,5	5,93	758,92
05/31/23 12:00:00 AM	17,5	5,94	752,91
05/30/23 11:00:00 PM	17,5	5,94	755,71
05/30/23 10:00:00 PM	17,4	5,95	752,8
05/30/23 09:00:00 PM	16,94	5,96	754,55
05/30/23 08:00:00 PM	18,66	5,95	756,55
05/30/23 07:00:00 PM	20,19	5,96	756,36
05/30/23 06:00:00 PM	20,08	5,97	757,58
05/30/23 05:00:00 PM	241,49	5,99	757,05
05/30/23 04:00:00 PM	723,14	6,02	758,12
05/30/23 03:00:00 PM	730,91	6,05	758,52
05/30/23 02:00:00 PM	835,95	6,08	752,81
05/30/23 01:00:00 PM	1227,56	6,11	752,47
05/30/23 12:00:00 PM	995,8	6,13	753,44
05/30/23 11:00:00 AM	1231,04	6,16	754,59
05/30/23 10:00:00 AM	3884,77	6,19	758,67
05/30/23 09:00:00 AM	16852,52	6,22	758,58
05/30/23 08:00:00 AM	1781,53	6,25	759,61
05/30/23 07:00:00 AM	612,59	6,28	760
05/30/23 06:00:00 AM	111,61	6,31	760,76
05/30/23 05:00:00 AM	19,99	6,32	761,22
05/30/23 04:00:00 AM	19,16	6,32	761,03
05/30/23 03:00:00 AM	19,17	6,33	761,41
05/30/23 02:00:00 AM	19,17	6,34	751,97
05/30/23 01:00:00 AM	19,17	6,35	752,41
05/30/23 12:00:00 AM	18,89	6,36	753,06

Time	Lux Meter	pH Meter	TDS Meter
05/29/23 11:00:00 PM	18,99	6,38	753,96
05/29/23 10:00:00 PM	19,1	6,41	754,46
05/29/23 09:00:00 PM	18,92	6,44	751,13
05/29/23 08:00:00 PM	18,49	6,45	752,44
05/29/23 07:00:00 PM	18,31	6,46	751,19
05/29/23 06:00:00 PM	18,7	6,47	752,57
05/29/23 05:00:00 PM	107,78	6,48	753,25
05/29/23 04:00:00 PM	539,06	6,49	753,3
05/29/23 03:00:00 PM	665	6,5	754,24
05/29/23 02:00:00 PM	1000,59	6,51	754,68
05/29/23 01:00:00 PM	884,78	6,52	751,21
05/29/23 12:00:00 PM	1046,17	6,53	755,2
05/29/23 11:00:00 AM	1318,17	6,54	757,88
05/29/23 10:00:00 AM	2224,47	6,56	758,6
05/29/23 09:00:00 AM	14992,16	6,56	759,93
05/29/23 08:00:00 AM	1205,15	6,59	760,61
05/29/23 04:00:00 AM	23,33	6,61	751,3
05/29/23 03:00:00 AM	23,71	6,61	753,66
05/27/23 09:00:00 AM	4711,19	6,62	761,62
05/27/23 08:00:00 AM	1375,11	6,63	762,15
05/27/23 07:00:00 AM	565,01	6,64	763,17
05/27/23 06:00:00 AM	83,75	6,65	751,26
05/27/23 05:00:00 AM	24,08	6,67	752,64
05/27/23 04:00:00 AM	23,33	6,68	753,41
05/27/23 03:00:00 AM	23,35	6,68	754,3
05/27/23 02:00:00 AM	23,33	6,7	756,16
05/27/23 01:00:00 AM	23,33	6,71	759,82
05/27/23 12:00:00 AM	23,33	6,72	759,39
05/26/23 11:00:00 PM	23,32	6,73	760,21
05/26/23 10:00:00 PM	23,32	6,73	761,24
05/26/23 09:00:00 PM	23,13	6,73	762,64
05/26/23 08:00:00 PM	23,12	6,74	751,15
05/26/23 07:00:00 PM	22,82	6,76	752,41
05/26/23 06:00:00 PM	23,2	6,77	753,43
05/26/23 05:00:00 PM	218,25	6,78	753,09
05/26/23 04:00:00 PM	628,72	6,78	753,22
05/26/23 03:00:00 PM	709,31	6,74	754,41
05/26/23 02:00:00 PM	805,53	6,76	755,81
05/26/23 01:00:00 PM	923,74	6,79	751,94
05/26/23 12:00:00 PM	988,04	6,8	755,67

Time	Lux Meter	pH Meter	TDS Meter
05/26/23 11:00:00 AM	1201,91	6,8	753,87
05/26/23 10:00:00 AM	1467,78	6,82	756,04
05/26/23 09:00:00 AM	10460,24	6,81	752,68
05/26/23 08:00:00 AM	1026,64	6,81	753,39
05/26/23 07:00:00 AM	681,49	6,81	754,7
05/26/23 06:00:00 AM	206,6	6,81	755,81
05/26/23 05:00:00 AM	24,63	6,82	756,62
05/26/23 04:00:00 AM	24,17	6,83	757,49
05/26/23 03:00:00 AM	24,17	6,84	756,16
05/26/23 02:00:00 AM	24,17	6,85	757,47
05/26/23 01:00:00 AM	24,14	6,87	757,04
05/26/23 12:00:00 AM	24,09	6,88	758,75
05/25/23 11:00:00 PM	23,71	6,89	752,43
05/25/23 10:00:00 PM	24,38	6,89	753,42
05/25/23 09:00:00 PM	24,66	6,89	754,41
05/25/23 08:00:00 PM	23,68	6,88	755,76
05/25/23 07:00:00 PM	23,43	6,88	756,23
05/25/23 06:00:00 PM	23,94	6,88	756,6
05/25/23 05:00:00 PM	127,88	6,88	756,82
05/25/23 04:00:00 PM	509,6	6,89	757,16
05/25/23 03:00:00 PM	757,41	6,8	758,26
05/25/23 02:00:00 PM	889,61	5,52	753,27
05/25/23 01:00:00 PM	1007,09	5,53	756,63
05/25/23 12:00:00 PM	1067,97	5,55	754,58
05/25/23 11:00:00 AM	1176,5	5,58	755,88
05/25/23 10:00:00 AM	934,1	5,6	757,23
05/25/23 09:00:00 AM	1667,2	5,63	758,75
05/25/23 08:00:00 AM	748,41	5,64	760,86
05/25/23 07:00:00 AM	307,17	5,67	764,73
05/25/23 06:00:00 AM	85,04	5,68	765,24
05/25/23 05:00:00 AM	26,48	5,71	766,01
05/25/23 04:00:00 AM	26,17	5,73	765,75
05/25/23 03:00:00 AM	26,31	5,74	765,11
05/25/23 02:00:00 AM	26,16	5,76	752,63
05/25/23 01:00:00 AM	26,29	5,77	752,92
05/25/23 12:00:00 AM	26,05	5,79	753,69
05/24/23 11:00:00 PM	25,88	5,81	754,57
05/24/23 10:00:00 PM	25,77	5,83	755,42
05/24/23 09:00:00 PM	25,76	5,85	757,66
05/24/23 08:00:00 PM	25,54	5,87	757,89

Time	Lux Meter	pH Meter	TDS Meter
05/24/23 07:00:00 PM	24,16	5,86	758,28
05/24/23 06:00:00 PM	21,96	5,89	759,41
05/24/23 05:00:00 PM	179,76	5,92	760,35
05/24/23 04:00:00 PM	434,15	5,95	760,89
05/24/23 03:00:00 PM	677,92	5,96	759,44
05/24/23 02:00:00 PM	1043,34	5,96	752,47
05/24/23 01:00:00 PM	1030,14	5,99	755,28
05/24/23 12:00:00 PM	1228,94	5,97	757,14
05/24/23 11:00:00 AM	1676,03	5,98	760,11
05/24/23 10:00:00 AM	1919,85	6	761,63
05/24/23 09:00:00 AM	8600,08	6	753,49
05/24/23 08:00:00 AM	1037,87	6,01	754,41
05/24/23 07:00:00 AM	590,35	6,03	756,31
05/24/23 06:00:00 AM	355,15	6,05	756,21
05/24/23 05:00:00 AM	26,32	6,05	757,11
05/24/23 04:00:00 AM	25,28	6,06	757,61
05/24/23 03:00:00 AM	25,09	6,07	758,51
05/24/23 02:00:00 AM	25,09	6,09	760,49
05/24/23 01:00:00 AM	25,05	6,1	751,76
05/24/23 12:00:00 AM	25,02	6,12	754,13
05/23/23 11:00:00 PM	25,01	6,13	757,64
05/23/23 10:00:00 PM	25	6,14	759,67
05/23/23 09:00:00 PM	25	6,14	759,81
05/23/23 08:00:00 PM	25	6,17	761,16
05/23/23 07:00:00 PM	25	6,18	763,85
05/23/23 06:00:00 PM	24,13	6,19	761,8
05/23/23 05:00:00 PM	116,6	6,21	761,45
05/23/23 04:00:00 PM	375,46	6,21	763,5
05/23/23 03:00:00 PM	489,48	6,21	764,66
05/23/23 02:00:00 PM	460,62	6,22	752,19
05/23/23 01:00:00 PM	305,11	6,23	756,21
05/23/23 12:00:00 PM	783,62	6,24	758,92
05/23/23 11:00:00 AM	1074,85	6,25	761,96
05/23/23 10:00:00 AM	1275,39	6,25	765,82
05/23/23 09:00:00 AM	857,93	6,27	767,03
05/23/23 08:00:00 AM	553,29	6,28	768,69
05/23/23 07:00:00 AM	305,44	6,29	771,97
05/23/23 06:00:00 AM	138,12	6,31	773
05/23/23 05:00:00 AM	25,66	6,31	775,76
05/23/23 04:00:00 AM	25	6,32	776,23

Time	Lux Meter	pH Meter	TDS Meter
05/23/23 03:00:00 AM	25	6,34	777,61
05/23/23 02:00:00 AM	25	6,33	778,49
05/23/23 01:00:00 AM	24,99	6,35	778,34
05/23/23 12:00:00 AM	24,94	6,36	778,48
05/22/23 11:00:00 PM	24,44	6,38	779,85
05/22/23 10:00:00 PM	24,7	6,42	779,3
05/22/23 09:00:00 PM	24,31	6,42	780,39
05/22/23 08:00:00 PM	24,39	6,43	782,9
05/22/23 07:00:00 PM	24,49	6,44	783,04
05/22/23 06:00:00 PM	23,58	6,44	784,16
05/22/23 05:00:00 PM	161,86	6,42	785,53
05/22/23 04:00:00 PM	502,13	6,42	788,34
05/22/23 03:00:00 PM	742,5	6,43	790,42
05/22/23 02:00:00 PM	939,93	6,45	792,29
05/22/23 01:00:00 PM	987,23	6,45	798,46
05/22/23 12:00:00 PM	695,49	6,42	801,58
05/22/23 11:00:00 AM	1458,96	6,46	803,63
05/22/23 10:00:00 AM	1541,55	6,46	809,67
05/22/23 09:00:00 AM	3774,7	6,47	813,13
05/22/23 08:00:00 AM	652,08	6,48	815,93
05/22/23 07:00:00 AM	287,38	6,49	817,69
05/22/23 06:00:00 AM	84,39	6,51	817,52
05/22/23 05:00:00 AM	24,84	6,48	817,68
05/22/23 04:00:00 AM	24,17	6,53	818,13
05/22/23 03:00:00 AM	24,17	6,54	818,69
05/22/23 02:00:00 AM	24,16	6,56	818,16
05/22/23 01:00:00 AM	24,17	6,57	819
05/22/23 12:00:00 AM	24,14	6,57	819,46
05/21/23 11:00:00 PM	24,03	6,58	820,44
05/21/23 10:00:00 PM	23,9	6,59	821,32
05/21/23 09:00:00 PM	23,53	6,6	824,84
05/21/23 08:00:00 PM	23,34	6,61	824,97
05/21/23 07:00:00 PM	23,54	6,62	826,71
05/21/23 06:00:00 PM	24,57	6,63	825,91
05/21/23 05:00:00 PM	177,67	6,65	825,38
05/21/23 04:00:00 PM	572,4	6,67	825,58
05/21/23 03:00:00 PM	693,03	6,68	826,22
05/21/23 02:00:00 PM	810,73	6,69	829,86
05/21/23 01:00:00 PM	909,36	6,69	832,29
05/21/23 12:00:00 PM	1150,41	6,7	834,08

Time	Lux Meter	pH Meter	TDS Meter
05/21/23 11:00:00 AM	1613,94	6,71	839,04
05/21/23 10:00:00 AM	1722,79	6,71	841,68
05/21/23 09:00:00 AM	15067,44	6,72	846,48
05/21/23 08:00:00 AM	1019,36	6,72	848,24
05/21/23 07:00:00 AM	866,57	6,73	851,17
05/21/23 06:00:00 AM	162,03	6,73	852,29
05/21/23 05:00:00 AM	27,38	6,73	855,15
05/21/23 04:00:00 AM	26,61	6,76	854,77
05/21/23 03:00:00 AM	26,1	6,76	854,13
05/21/23 02:00:00 AM	25,84	6,77	856,96
05/21/23 01:00:00 AM	25,83	6,78	857,15
05/21/23 12:00:00 AM	25,83	6,79	860,26
05/20/23 11:00:00 PM	25,82	6,79	861,14
05/20/23 10:00:00 PM	25,42	6,8	861,08
05/20/23 09:00:00 PM	25,12	6,8	863,28
05/20/23 08:00:00 PM	25,22	6,8	863,65
05/20/23 07:00:00 PM	25	6,82	864,39
05/20/23 06:00:00 PM	22,37	6,83	864,61
05/20/23 05:00:00 PM	142,39	6,85	866,52
05/20/23 04:00:00 PM	526,39	6,85	868,61
05/20/23 03:00:00 PM	675,24	6,86	871
05/20/23 02:00:00 PM	666,82	6,87	873,82
05/20/23 01:00:00 PM	993,91	6,87	874,31
05/20/23 12:00:00 PM	855,36	6,87	872,32
05/20/23 11:00:00 AM	1568,35	6,88	874,42
05/20/23 10:00:00 AM	1483,49	6,88	875,6
05/20/23 09:00:00 AM	7905,3	6,84	878,77
05/20/23 08:00:00 AM	935,13	6,89	880,52
05/20/23 07:00:00 AM	825,58	6,91	883,77
05/20/23 06:00:00 AM	128,67	6,94	883,45
05/20/23 05:00:00 AM	27,87	6,91	885,04
05/20/23 04:00:00 AM	27,41	6,91	886,14
05/20/23 03:00:00 AM	27,45	6,91	887,3
05/20/23 02:00:00 AM	26,91	6,91	889,84
05/20/23 01:00:00 AM	26,29	6,89	890,8
05/20/23 12:00:00 AM	25,83	6,92	891,32
05/19/23 11:00:00 PM	25,83	6,92	891,13
05/19/23 10:00:00 PM	25,86	6,92	893,06
05/19/23 09:00:00 PM	25,81	6,92	892,89
05/19/23 08:00:00 PM	25,8	6,92	893,24

Lampiran 4 Biaya pembuatan hidroponik dan sistem kontrol

No.	Nama Barang	Jumlah	Satuan	Harga Satuan	Total
A	Komponen Hidroponik				Rp1,637,670
1	Pipa 2,5"	1	Batang	Rp83,000	Rp83,000
2	Pipa 2"	1	Batang	Rp63,000	Rp63,000
3	Pipa 1"	1	Batang	Rp48,000	Rp48,000
4	Pipa 3/4"	2	Batang	Rp30,000	Rp60,000
5	Over Sock 2,5x2"	6	Pcs	Rp10,000	Rp60,000
6	Over Sock 2x1"	2	Pcs	Rp10,000	Rp20,000
7	Dop 2,5"	2	Pcs	Rp7,000	Rp14,000
8	L Bow 2"	7	Pcs	Rp8,000	Rp56,000
9	L Bow 1"	4	Pcs	Rp5,000	Rp20,000
10	L Bow 3/4"	10	Pcs	Rp3,000	Rp30,000
11	T Pipa 3/4"	10	Pcs	Rp3,000	Rp30,000
12	Isolasi Pipa	2	Pcs	Rp5,000	Rp10,000
13	Lem pipa odol	1	Pcs	Rp13,000	Rp13,000
14	Besi siku lubang 3 Meter	3	Batang	Rp42,500	Rp127,500
15	Siku plat segitiga	4	Pcs	Rp1,300	Rp5,200
16	Kaki karet siku	4	Pcs	Rp1,900	Rp7,600
17	Baut	12	Pcs	Rp885	Rp10,620
18	Plastik UV 14%	2	Meter	Rp37,000	Rp74,000
19	Amplas	1	Meter	Rp15,000	Rp15,000
20	Aluminium batang	6	Meter	Rp10,000	Rp60,000
21	Pompa celup	1	Pcs	Rp130,000	Rp130,000
22	Tray semai	1	Pcs	Rp15,000	Rp15,000
23	Netpot hitam	15	Pcs	Rp450	Rp6,750
24	Rockwool	2	Pcs	Rp17,500	Rp35,000
25	Kain flanel 50x50cm	2	Pcs	Rp7,000	Rp14,000
26	Gelas ukur 250mL	1	Pcs	Rp8,000	Rp8,000
27	Gelas ukur 1000mL	1	Pcs	Rp21,000	Rp21,000
28	pH Buffer powder 6.86	5	Pcs	Rp3,500	Rp17,500
29	pH Buffer powder 4.01	5	Pcs	Rp3,500	Rp17,500
30	pH Up 500mL	1	Pcs	Rp35,000	Rp35,000
31	pH Down 500mL	1	Pcs	Rp35,000	Rp35,000

No.	Nama Barang	Jumlah	Satuan	Harga Satuan	Total
32	Nutrisi AB Mix	1	Pcs	Rp100,000	Rp100,000
33	AB Mix premium 500mL cair	1	Pcs	Rp30,000	Rp30,000
34	Jerigen 5 L	2	Pcs	Rp11,000	Rp22,000
35	Lux meter	1	Pcs	Rp159,000	Rp159,000
36	TDS-EC + pH Meter	1	Pcs	Rp185,000	Rp185,000
B	Komponen sistem kontrol				Rp2,112,450
1	Power supply 24V	1	Pcs	Rp79,500	Rp79,500
2	ESP32 Devkit V1	1	Pcs	Rp66,500	Rp66,500
3	Relay 5V 1 Channel	4	Pcs	Rp5,900	Rp23,600
4	LED grow 18W	1	Pcs	Rp50,000	Rp50,000
5	Selang PVC silikon	6	Meter	Rp9,900	Rp59,400
6	GY-302 BH1750	1	Pcs	Rp35,000	Rp35,000
7	Kabel data micro USB	1	Pcs	Rp17,500	Rp17,500
8	PCB lubang 6x8cm	1	Pcs	Rp8,000	Rp8,000
9	DFRobot SEN0244	1	Pcs	Rp320,000	Rp320,000
10	pH Sensor SEN0161	1	Pcs	Rp699,000	Rp699,000
11	Kabel	7	Meter	Rp6,500	Rp45,500
12	Stopkontak	1	Pcs	Rp25,000	Rp25,000
13	Timah	1	Pcs	Rp15,500	Rp15,500
14	LCD 20x4	1	Pcs	Rp80,000	Rp80,000
15	I2C LCD	1	Pcs	Rp20,000	Rp20,000
16	Gland kabel hitam	4	Pcs	Rp5,000	Rp20,000
17	Header single female	2	Pcs	Rp1,500	Rp3,000
18	Header single male	2	Pcs	Rp1,500	Rp3,000
19	Terminal blok 3 pin	3	Pcs	Rp1,500	Rp4,500
20	Spacer 1cm	15	Pcs	Rp1,000	Rp15,000
21	Spacer 3cm	15	Pcs	Rp1,800	Rp27,000
22	I2C logic level converter	1	Pcs	Rp6,500	Rp6,500
23	Kabel tis	1	Pack	Rp18,000	Rp18,000
24	Fitting gantung	1	Pcs	Rp3,000	Rp3,000
25	Kabel jumper F-F	2	Pack	Rp8,500	Rp17,000
26	Kabel jumper F-M	4	Pack	Rp8,500	Rp34,000
27	Kabel serabut grey	5	Meter	Rp5,000	Rp25,000

No.	Nama Barang	Jumlah	Satuan	Harga Satuan	Total
28	Kabel serabut red	5	Meter	Rp5,000	Rp25,000
29	Kepala colokan	2	Pcs	Rp12,000	Rp24,000
30	XL4015 DC-DC Converter	1	Pcs	Rp18,000	Rp18,000
31	Pompa kecil	3	Pcs	Rp29,000	Rp87,000
32	Kabel konektor pin	5	Pcs	Rp1,500	Rp7,500
33	Box akrilik	1	Pcs	Rp65,000	Rp65,000
34	Blynk premium	1	Bulan	Rp105,950	Rp105,950
35	Isi lem tembak	2	Pcs	Rp4,000	Rp8,000
36	Toples 2,5 L	2	Pcs	Rp11,500	Rp23,000
37	Toples 10 L	1	Pcs	Rp28,500	Rp28,500
Total biaya keseluruhan (A+B)					Rp3,750,120

Lampiran 5 Program

```

#include "DFRobot_ESP_PH.h"
#include "EEPROM.h"
#include <Wire.h>
#include <BH1750.h>
#include <LiquidCrystal_I2C.h>
#include <BlynkSimpleEsp32.h>

#define BLYNK_TEMPLATE_ID "TMPLQxtstHKL"
#define BLYNK_TEMPLATE_NAME "Skripsi"
#define BLYNK_AUTH_TOKEN "cvS8K1i5QR-ku4hF1LI7QJwkGHGehtuF"
#define BLYNK_PRINT Serial

//Inisiasi TDS Meter
#include <EEPROM.h>
#include "GravityTDS.h"
#define TdsSensorPin 34
#define EEPROM_SIZE 512
const int PumpTDS = 14;
GravityTDS gravityTds;
float tdsValue;

//Inisiasi PH Meter
DFRobot_ESP_PH ph;
#define ESPADC 4096.0
#define ESPVOLTAGE 3300
#define PH_PIN 35 // pin Sensor pH
const int PumpPH1 = 13; //Pompa PH Naik
const int PumpPH2 = 26; //Pompa PH Penurun
float voltage, phValue, temperature = 25;

//Inisiasi Lux Meter
const int Lamp = 27;
BH1750 lightMeter;
float lux;

//Inisiasi LCD
LiquidCrystal_I2C lcd = LiquidCrystal_I2C(0x27, 20, 4);

char auth[] = BLYNK_AUTH_TOKEN;
char ssid[] = "TEKNIK09";
char pass[] = "Teknik09-";

void setup()
{
  Serial.begin(115200);
  //Inisiasi PinMode
  pinMode(PumpPH1, OUTPUT);

```

```

pinMode(PumpPH2, OUTPUT);
pinMode(Lamp, OUTPUT);
pinMode(PumpTDS, OUTPUT);
EEPROM.begin(32);
EEPROM.begin(EEPROM_SIZE);
gravityTds.setPin(TdsSensorPin);
gravityTds.setAref(3.3);
gravityTds.setAdcRange(4096);
gravityTds.begin();
ph.begin();
lcd.init();
lcd.backlight();
lcd.clear();
Wire.begin();
Wire.setClock(10000);
lightMeter.begin();
Serial.print("Connecting to ");
Serial.println(ssid);
WiFi.begin(ssid, pass);
int wifi_ctr = 0;
while (WiFi.status() != WL_CONNECTED) {
  delay(500);
  Serial.print(".");
}
Serial.println("WiFi connected");
Blynk.begin(auth, ssid, pass, "sgp1.blynk.cloud", 80);
}

void loop() {
  sensorcahaya();
  tampilann();
  kirimdatablynk();
  sensorph();
  sensortds();
  delay(1000);
  lcd.clear();
}

int sensorcahaya() {
  lux = lightMeter.readLightLevel();
  if(lux<150){
    digitalWrite(Lamp, LOW);
  }
  else{
    digitalWrite(Lamp, HIGH);
  }
}

```

```

void tampilann() {
  lcd.setCursor(0, 0);
  lcd.print("lumen  :");
  lcd.setCursor(9, 0);
  lcd.print(lux);
  lcd.setCursor(0, 1);
  lcd.print("pH    :");
  lcd.setCursor(9, 1);
  lcd.print(phValue);
  lcd.setCursor(0, 2);
  lcd.print("Nutrisi :");
  lcd.setCursor(9, 2);
  lcd.print(tdsValue);
}

void kirimdatablynk() {
  Blynk.virtualWrite(V0, lux);
  Blynk.virtualWrite(V1, phValue);
  Blynk.virtualWrite(V2, tdsValue);
  Blynk.run();
}

float sensorph()
{
  static unsigned long timepoint = millis();
  if (millis() - timepoint > 1000U) //time interval: 1s
  {
    timepoint = millis();
    voltage = analogRead(PH_PIN) / ESPADC * ESPVOLTAGE; // read the voltage
    Serial.print("voltage:");
    Serial.println(voltage, 4);

    Serial.print("temperature:");
    Serial.print(temperature, 1);
    Serial.println("^C");

    pHValue = ph.readPH(voltage, temperature); // convert voltage to pH with
    temperature compensation
    Serial.print("pH:");
    Serial.println(pHValue, 4);

    if(pHValue>7.5){
      digitalWrite(PumpPH2, LOW);
      digitalWrite(PumpPH1, HIGH);
      Serial.print("Pump 2 Nyala");
    } else if (pHValue<5.5) {

      digitalWrite(PumpPH2, HIGH);

```

```
    digitalWrite(PumpPH1, LOW);
    Serial.print("Pump 1 Nyala");
  }else {
    digitalWrite(PumpPH1, HIGH);
    digitalWrite(PumpPH2, HIGH);
  }
  ph.calibration(voltage, temperature); // calibration process by Serail CMD
}
}

float sensortds()
{
  gravityTds.setTemperature(temperature); // set the temperature and execute
  temperature compensation
  gravityTds.update(); //sample and calculate
  tdsValue = gravityTds.getTdsValue(); // then get the value
  Serial.print(tdsValue,0);
  Serial.println("ppm");

  if(tdsValue<750){
    digitalWrite(PumpTDS, LOW);
  }
  else{
    digitalWrite(PumpTDS, HIGH);
  }
  delay(1000);
}
```

Lampiran 6 Analisis Ekonomi

1. Biaya Tetap :
 - Media hidroponik : Rp9.000.000
 - Sistem kontrol : Rp2.250.000
 - Total : Rp11.250.000
2. Biaya Variabel :
 - Nutrisi AB *Mix* : Rp100.000
 - Bibit : Rp50.000
 - Total : Rp150.000
3. Harga per tanaman : Rp15.000
4. Biaya produksi per tanaman : $\frac{150.000}{250} = Rp600$
5. Jumlah produksi : 250pcs/35 hari
6. Pendapatan per bulan : Rp3.750.000
7. Pendapatan bersih per bulan : Rp3.600.000
8. $BEP (sistem) = \frac{11.250.000}{(15.000-600)} = \frac{11.250.000}{(14.400)} = 781,25 pcs$

Jika ingin mencapai BEP (sistem) maka diperlukan 782 pcs tanaman selada yang harus terjual secara keseluruhan.

Jika produksi setiap bulan berjumlah 250 pcs tanaman, maka waktu yang diperlukan untuk mencapai BEP selama 140 hari dengan total hasil penjualan sebanyak 1.000 pcs.

$$9. \quad BEP (konvensional) = \frac{9.000.000}{(15.000-600)} = \frac{9.000.000}{(14.400)} = 625 pcs$$

Jika ingin mencapai BEP (konvensional) maka diperlukan 625 pcs tanaman selada yang harus terjual secara keseluruhan.

Jika produksi setiap bulan berjumlah 250 pcs tanaman, maka waktu yang diperlukan untuk mencapai BEP selama 120 hari dengan total hasil penjualan sebanyak 750 pcs.