

LAMPIRAN

Environmental Impact Analysis Reports



PEMERINTAH PROVINSI LAMPUNG
DINAS PENANAMAN MODAL DAN
PELAYANAN TERPADUSATU PINTU

Jalan Dr. Warsito No. 2 Telp. (0721) 482372, Fax (0721) 482372

TELUKBETUNG



Kode Pos : 35221

**KEPUTUSAN KEPALA DINAS PENANAMAN MODAL DAN PELAYANAN
TERPADU SATU PINTU PROVINSI LAMPUNG**
NOMOR : 660 / 10.123 /A 0000634/V.16/2020
TENTANG

**IZIN LINGKUNGAN USAHA DAN/ATAU KEGIATAN SISTEM IRIGASI
WAY SEKAMPUNG DI KABUPATEN PESAWARAN, KABUPATEN
LAMPUNG TENGAH, KABUPATEN LAMPUNG TIMUR DAN
KOTA METRO PROVINSI LAMPUNG**

**KEPALA DINAS PENANAMAN MODAL DAN PELAYANAN TERPADU SATU PINTU
PROVINSI LAMPUNG,**

Menimbang :

- a. berdasarkan Surat Edaran Menteri Lingkungan Hidup dan Kehutanan Nomor : S.541/MENLHK/SETJEN/PLA.4/12/2016 tertanggal 28 Desember 2016 Perihal Penyelesaian Dokumen Lingkungan Hidup Bagi Kegiatan yang Telah Berjalan;
- b. bahwa berdasarkan ketentuan pasal 1 ayat (1) Peraturan Pemerintah Nomor 27 Tahun 2012 tentang Izin Lingkungan, Amdal adalah kajian mengenai dampak besar dan penting suatu usaha dan atau kegiatan yang direncanakan pada lingkungan hidup yang diperlukan bagi proses pengambilan keputusan tentang penyelegaraan usaha dan atau kegiatan;
- c. bahwa berdasarkan pasal 1 Nomor urut 2 Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor : P.102/MENLHK/SETJEN-KUM.1/2016 tentang Pedoman Penyusunan Dokumen Lingkungan Hidup Bagi Usaha dan/atau kegiatan yang telah Memiliki Izin Usaha dan/atau kegiatan tetapi belum memiliki Dokumen Lingkungan Hidup, Dokumen Evaluasi Lingkungan Hidup (DELH) adalah dokumen yang memuat pengelolaan dan pemantauan lingkungan hidup yang merupakan bagian dari proses audit lingkungan hidup yang dikenakan bagi usaha dan/atau kegiatan yang sudah memiliki izin usaha dan/atau kegiatan tetapi belum memiliki dokumen amdal;
- d. bahwa usaha dan/atau kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung, merupakan usaha dan/atau kegiatan yang wajib memiliki Analisis Mengenai Dampak Lingkungan (AMDAL);
- e. bahwa dalam rangka pengendalian dampak penting terhadap lingkungan hidup akibat usaha dan/atau kegiatan yang dilakukan tersebut, maka perlu disusun Dokumen Evaluasi Lingkungan Hidup (DELH);
- f. bahwa sehubungan dengan maksud huruf a, b, c, d dan e tersebut di atas, perlu menetapkan Keputusan Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Lampung tentang Izin Lingkungan Usaha dan/atau Kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung.

Mengingat

- : 1. Undang-Undang Nomor : 5 Tahun 1990 tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya;
2. Undang-Undang Nomor : 26 Tahun 2007 tentang Penataan Ruang;
3. Undang-Undang Nomor : 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup;
4. Undang-Undang Nomor : 23 Tahun 2014 tentang Pemerintahan Daerah sebagaimana telah diubah beberapa kali terakhir dengan Undang-Undang Nomor : 9 Tahun 2015;
5. Undang Undang Republik Indonesia Nomor : 11 Tahun 1974 tentang Pengairan;
6. Undang Undang Republik Indonesia Nomor : 17 Tahun 2019 tentang Sumber Daya Air;
7. Peraturan Pemerintah Nomor : 41 Tahun 1999 tentang Pengendalian Pencemaran Udara;
8. Peraturan Pemerintah Nomor : 82 Tahun 2001 tentang Pengelolaan Kualitas Air dan Pengendalian Pencemaran Air;
9. Peraturan Pemerintah Republik Indonesia Nomor : 38 Tahun 2011 tentang Sungai;
10. Peraturan Pemerintah Nomor : 27 Tahun 2012 tentang Izin Lingkungan;
11. Peraturan Pemerintah Nomor : 101 Tahun 2014 tentang Pengelolaan Limbah Bahan Beracun dan Berbahaya;
12. Peraturan Pemerintah Nomor : 08 Tahun 2013 tentang Tata Laksana Penilaian dan Pemeriksaan Dokumen Lingkungan Hidup Serta Penerbitan Izin Lingkungan;
13. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor : 38/MENLHK/ SETJEN/KUM.1/12/2019 tentang Jenis usaha dan/atau kegiatan yang wajib Amdal;
14. Peraturan Menteri Negara Lingkungan Hidup dan Kehutanan Nomor : P.68 Tahun 2016 tentang Baku Mutu Air Limbah Domestik;
15. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor : P.102/MENLHK/SETJEN-KUM.1/2016 tentang Pedoman Penyusunan Dokumen Lingkungan Hidup Bagi Usaha dan/atau kegiatan yang telah Memiliki Izin Usaha dan/atau kegiatan tetapi belum memiliki Dokumen Lingkungan Hidup;
16. Surat Edaran Menteri Lingkungan Hidup dan Kehutanan Nomor : S.541/MENLHK/SETJEN/PLA.4/12/2016 tentang Penyelesaian Dokumen Lingkungan Hidup Bagi Kegiatan Yang Sudah Berjalan;
17. Peraturan Daerah Provinsi Lampung Nomor : 08 Tahun 2016 tentang Pembentukan dan Susunan Perangkat Daerah Provinsi Lampung;

Memperhatikan :

1. Surat dari Kepala Dinas Lingkungan Hidup Provinsi Lampung Nomor : 660/150/V.10/2020 tanggal 18 Agustus 2020 tentang Arahan Penyusunan Dokumen Lingkungan Hidup;

2. Surat dari Kepala Balai Besar Wilayah Sungai Mesuji Sekampung Nomor : S4.0103-AW/642 tanggal 6 November 2020 perihal Penyampaian Dokumen Evaluasi Lingkungan Hidup (DELH) usaha dan/atau kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung;
3. Hasil Rapat penilaian Dokumen Evaluasi Lingkungan Hidup usaha dan/atau kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung pada hari Selasa, 24 November 2020 dengan Berita Acara Nomor; 164/KOMDAL/V.10/2020;
4. Hasil Verifikasi perbaikan Dokumen Evaluasi Lingkungan Hidup Usaha dan/atau Kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung dengan Berita Acara Nomor : 172/KOMDAL/ V.10/2020 tanggal 4 Desember 2020 dan dinyatakan telah diperbaiki sesuai arahan oleh Tim Teknis Komisi Penilai Amdal Provinsi Lampung;
5. Keputusan Kepala Dinas Lingkungan Hidup Provinsi Lampung Nomor : 660/178/V.10/2020 tanggal 10 Desember 2020 tentang Dokumen Evaluasi Lingkungan Hidup (DELH) usaha dan/atau kegiatan Sistem Irigasi Way sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung;

MEMUTUSKAN :

Menetapkan :

IZIN LINGKUNGAN USAHA DAN/ATAU KEGIATAN SISTEM IRIGASI WAY SEKAMPUNG DI KABUPATEN PESAWARAN, KABUPATEN LAMPUNG TENGAH, KABUPATEN LAMPUNG TIMUR DAN KOTA METRO PROVINSI LAMPUNG OLEH BALAI BESAR WILAYAH SUNGAI MESUJI SEKAMPUNG.

KESATU :

Memberikan izin lingkungan kepada :

- a. Nama Pemrakarsa : Balai Besar Wilayah Sungai Mesuji Sekampung;
- b. Penanggung Jawab : Ir. H. Abdul Muis, MT.;
- c. Jabatan : Kepala;
- d. Alamat Kantor : Jalan Gatot Subroto No. 57 Bandar Lampung 35401;
Telpon : +62721 480722;
Faximile : +62721 482478;
- e. Luasan/besaran : 55.373 Ha;
- f. Kegiatan/usaha : Sistem Irigasi Way Sekampung;

g. Lokasi kegiatan : Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung;

- KEDUA** : Penerima Keputusan sebagaimana dimaksud pada Diktum Kesatu sebagai penanggung jawab melakukan pengelolaan dan pemantauan terhadap sumber dampak kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung pada saat :
- 1) Pengoperasian bendung dan kelengkapannya;
 - 2) Pemeliharaan bendung dan kelengkapannya;
 - 3) Pengoperasian jaringan irigasi;
 - 4) Pemeliharaan rutin jaringan irigasi;
 - 5) Pemeliharaan berkala jaringan irigasi;
 - 6) Rehabilitasi jaringan irigasi;
 - 7) Penanggulangan/perbaikan darurat;
- KETIGA** : Dokumen Evaluasi Lingkungan Hidup usaha dan/atau Kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung, sebagaimana dimaksud dalam diktum KEDUA, digunakan sebagai acuan dalam pelaksanaan pengelolaan lingkungan hidup dan pemantauan lingkungan hidup.
- KEEMPAT** : Penerima Izin sebagaimana dimaksud pada Diktum Kesatu, dalam melaksanakan kegiatannya harus memenuhi memiliki izin perlindungan dan pengelolaan lingkungan hidup antara lain sebagai berikut:
- a. Izin mendirikan Tempat Penyimpanan Sementara (TPS) Limbah B3; dan
 - b. izin Perlindungan dan Pengelolaan Lingkungan Hidup (PPLH) lainnya sesuai ketentuan peraturan perundang-undangan yang berlaku.
- KELIMA** : Instansi pemberi izin perlindungan dan pengelolaan lingkungan hidup wajib memperhatikan Izin Lingkungan sebagai syarat penerbitan izin dalam pelaksanaan kegiatan sebagaimana dimaksud dalam Diktum Kedua.
- KEENAM** : Penerima izin sebagaimana dimaksud pada Diktum Kesatu wajib melaporkan hasil pelaksanaan pengelolaan lingkungan hidup dan pemantauan lingkungan hidup setiap 6 (enam) bulan sekali kepada:
- a. Menteri Lingkungan Hidup dan Kehutanan Republik Indonesia;
 - b. Gubernur Lampung;
 - c. Pusat Pengendalian Pembangunan Ekoregion Sumatera;
 - d. Dinas Lingkungan Hidup Provinsi Lampung;
 - e. Dinas Lingkungan Hidup Kabupaten Pesawaran;
 - f. Dinas Lingkungan Hidup Kabupaten Lampung Tengah;
 - g. Dinas Lingkungan Hidup Kabupaten Lampung Timur;
 - h. Dinas Lingkungan Hidup Kota Metro;

- KETUJUH** : Instansi pemberi izin wajib mencantumkan persyaratan dan kewajiban yang tercantum dalam keputusan Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Lampung ini serta Dokumen Evaluasi Lingkungan Hidup (DELH) sebagai ketentuan dalam izin melakukan usaha dan/atau kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung.
- KEDELAPAN** : Sebagai pelaksanaan fungsi pengawasan terhadap Dokumen Evaluasi Lingkungan Hidup (DELH) usaha dan/atau kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung, maka Dinas Lingkungan Hidup Provinsi Lampung, Dinas Lingkungan Hidup Kabupaten Pesawaran, Dinas Lingkungan Hidup Kabupaten Lampung Tengah, Dinas Lingkungan Hidup Kabupaten Lampung Timur dan Dinas Lingkungan Hidup Kota Metro setiap saat dapat melakukan pengawasan terhadap ketaatan penanggung jawab usaha dan/atau kegiatan atas kewajiban sebagaimana dimaksud dalam diktum KEDUA.
- KESEMBILAN** : Penerima izin sebagaimana dimaksud pada Diktum Kesatu menyampaikan laporan pelaksanaan persyaratan dan kewajiban sebagaimana dimaksud dalam Lampiran diluar dari komponen fisik, kimia dan biologi setiap 6 (enam) bulan sekali sejak Keputusan Kepala Dinas Penanaman Modal Dan Pelayanan Terpadu Satu Pintu Provinsi Lampung ini ditetapkan kepada instansi lain yang membidangi sebagaimana tercantum dalam Lampiran Keputusan ini.
- KESEPULUH** : Apabila berdasarkan hasil pelaksanaan usaha dan/atau kegiatan timbul dampak lingkungan hidup di luar dari dampak yang dikelola sebagaimana dimaksud dalam lampiran keputusan ini, penerima izin sebagaimana dimaksud pada Diktum Kesatu wajib melaporkan kepada instansi terkait.
- KESEBELAS** : Penerima izin sebagaimana dimaksud pada Diktum Kesatu wajib memberikan akses kepada pejabat pengawas lingkungan hidup untuk melakukan pengawasan sesuai dengan kewenangannya sebagaimana diatur dalam Pasal 74 Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup.
- KEDUABELAS** : Penerima izin sebagaimana dimaksud pada Diktum Kesatu yang melanggar ketentuan dalam Pasal 53 Peraturan Pemerintah Nomor 27 Tahun 2012 tentang Izin Lingkungan dapat dikenakan sanksi administratif, sebagaimana diatur dalam Pasal 71 Peraturan Pemerintah Nomor 27 Tahun 2012 tentang Izin Lingkungan.
- KETIGABELAS** : Penerima izin sebagaimana dimaksud pada Diktum Kesatu wajib mengajukan permohonan perubahan izin lingkungan apabila terjadi perubahan atas rencana usaha dan/atau kegiatannya sesuai dengan kriteria perubahan yang tercantum dalam Pasal 50 Peraturan Pemerintah Nomor 27 Tahun 2012 tentang Izin Lingkungan.
- KEEMPATBELAS** : Keputusan ini dapat dibatalkan apabila dikemudian hari ditemukan pelanggaran sebagaimana tercantum pada Pasal 37 ayat (2) Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup.

KELIMABELAS : Keputusan ini mulai berlaku pada tanggal ditetapkan dengan ketentuan apabila dikemudian hari ternyata terdapat kekeliruan dalam Keputusan ini akan diadakan pembetulan sebagaimana mestinya.

Ditetapkan di Teluk Betung
pada tanggal 16 Desember 2020

**KEPALA DINAS PENANAMAN MODAL DAN
PELAYANAN TERPADU SATU PINTU
PROVINSI LAMPUNG**



Drs. QUDROTUL IKHWAN. M.M.
Pembina Utama Madya
NIP. 19650107 199402 1 001

Tembusan:

1. Menteri Lingkungan Hidup dan Kehutanan RI di Jakarta;
2. Gubernur Lampung di Telukbetung;
3. Kepala Pusat Pengabdian Pembangunan Ekoregion Sumatera di Pekanbaru;
4. Kepala Dinas Lingkungan Hidup Provinsi Lampung di Telukbetung;
5. Kepala Dinas Lingkungan Hidup Kabupaten Pesawaran di Kedondong;
6. Kepala Dinas Lingkungan Hidup Kabupaten Lampung Tengah di Gunung Sugih;
7. Kepala Dinas Lingkungan Hidup Kabupaten Lampung Timur di Sukadana;
8. Kepala Dinas Lingkungan Hidup Kota Metro di Metro



PEMERINTAH PROVINSI LAMPUNG
DINAS LINGKUNGAN HIDUP

Jalan Basuki Rachmat No. 10 Telp. (0721) 486761 Fax. (0721) 486559
BANDAR LAMPUNG

KEPUTUSAN

KEPALA DINAS LINGKUNGAN HIDUP PROVINSI LAMPUNG

NOMOR : 660/178/V.10/2020

TENTANG

**DOKUMEN EVALUASI LINGKUNGAN HIDUP USAHA DAN/ATAU KEGIATAN SISTEM IRIGASI WAY SEKAMPUNG DI KABUPATEN PESAWARAN, KABUPATEN LAMPUNG TENGAH, LAMPUNG TIMUR DAN KOTA METRO PROVINSI LAMPUNG
OLEH BALAI BESAR WILAYAH SUNGAI MESUJI SEKAMPUNG.**

KEPALA DINAS LINGKUNGAN HIDUP PROVINSI LAMPUNG

- Menimbang :
- a. berdasarkan Surat Edaran Menteri Lingkungan Hidup dan Kehutanan Nomor S.541/MENLHK/SETJEN/PLA.4/12/2016 tertanggal 28 Desember 2016 Perihal Penyelesaian Dokumen Lingkungan Hidup Bagi Kegiatan yang Telah Berjalan;
 - b. bahwa berdasarkan ketentuan pasal 1 ayat (1) Peraturan Pemerintah nomor 27 tahun 2012 tentang Izin Lingkungan, Amdal adalah kajian mengenai dampak besar dan penting suatu usaha dan atau kegiatan yang direncanakan pada lingkungan hidup yang diperlukan bagi proses pengambilan keputusan tentang penyelegaraan usaha dan atau kegiatan;
 - c. bahwa berdasarkan pasal 1 Nomor urut 2 Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor: P.102/MENLHK/SETJEN-KUM.1/2016 tentang Pedoman Penyusunan Dokumen Lingkungan Hidup Bagi Usaha dan/atau kegiatan yang telah Memiliki Izin Usaha dan/atau kegiatan tetapi belum memiliki Dokumen Lingkungan Hidup, Dokumen Evaluasi Lingkungan Hidup (DELH) adalah dokumen yang memuat pengelolaan dan pemantauan lingkungan hidup yang merupakan bagian dari proses audit lingkungan hidup yang dikenakan bagi usaha dan/atau kegiatan yang sudah memiliki izin usaha dan/atau kegiatan tetapi belum memiliki dokumen amdal;
 - d. bahwa usaha dan/atau kegiatan Sistem Irigasi Way Sekampung Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi, merupakan usaha dan/atau kegiatan yang wajib memiliki Analisis Mengenai Dampak Lingkungan (AMDAL);
 - e. bahwa dalam rangka pengendalian dampak penting terhadap lingkungan hidup akibat usaha dan/atau kegiatan yang dilakukan tersebut, maka perlu disusun Dokumen Evaluasi Lingkungan Hidup (DELH);
 - f. bahwa sehubungan dengan maksud huruf a,b, c, d dan e tersebut di atas, perlu menetapkan Keputusan Kepala Dinas Lingkungan Hidup Provinsi Lampung tentang Dokumen Evaluasi Lingkungan Hidup Usaha dan/atau Kegiatan Sistem Irigasi Way Sekampung Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi.

- Mengingat :
- 1. Undang-Undang Nomor 5 Tahun 1990 tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya;

2. Undang-Undang Nomor 26 Tahun 2007 tentang Penataan Ruang;
3. Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup;
4. Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah sebagaimana telah diubah beberapa kali terakhir dengan Undang-Undang Nomor 9 Tahun 2015;
5. Undang Undang Republik Indonesia Nomor 11 Tahun 1974 tentang Pengairan;
6. Undang Undang Republik Indonesia Nomor 17 Tahun 2019 tentang Sumber Daya Air;
7. Peraturan Pemerintah Nomor 41 Tahun 1999 tentang Pengendalian Pencemaran Udara;
8. Peraturan Pemerintah Nomor 82 Tahun 2001 tentang Pengelolaan Kualitas Air dan Pengendalian Pencemaran Air;
9. Peraturan Pemerintah Republik Indonesia Nomor 38 Tahun 2011 tentang Sungai;
10. Peraturan Pemerintah Nomor 27 Tahun 2012 tentang Izin Lingkungan;
11. Peraturan Pemerintah Nomor 101 Tahun 2014 tentang Pengelolaan Limbah Bahan Beracun dan Berbahaya;
12. Peraturan Pemerintah Nomor 08 Tahun 2013 tentang Tata Laksana Penilaian dan Pemeriksaan Dokumen Lingkungan Hidup Serta Penerbitan Izin Lingkungan;
13. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 38/MENLHK/ SETJEN/KUM.1/12/2019 tentang Jenis usaha dan/atau kegiatan yang wajib Amdal;
14. Peraturan Menteri Negara Lingkungan Hidup dan Kehutanan Nomor P.68 Tahun 2016 tentang Baku Mutu Air Limbah Domestik;
15. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor: P.102/MENLHK/SETJEN-KUM.1/2016 tentang Pedoman Penyusunan Dokumen Lingkungan Hidup Bagi Usaha dan/atau kegiatan yang telah Memiliki Izin Usaha dan/atau kegiatan tetapi belum memiliki Dokumen Lingkungan Hidup;
16. Surat Edaran Menteri Lingkungan Hidup dan Kehutanan Nomor: S.541/MENLHK/SETJEN/PLA.4/12/2016 tentang Penyelesaian Dokumen Lingkungan Hidup Bagi Kegiatan Yang Sudah Berjalan;
17. Peraturan Daerah Provinsi Lampung Nomor: 08 Tahun 2016 tentang Pembentukan dan Susunan Perangkat Daerah Provinsi Lampung;

Memperhatikan : 1. Surat dari Kepala Dinas Lingkungan Hidup Provinsi Lampung Nomor: 660/150/V.10/2020 tanggal 18 Agustus 2020 tentang Arahan Penyusunan Dokumen Lingkungan Hidup;

2. Surat dari Kepala Kepala Balai Besar Wilayah Sungai Mesuji Sekampung Nomor: S4.0103-AW/642 tanggal 6 November 2020 perihal Penyampaian Dokumen Evaluasi Lingkungan Hidup (DELH) usaha dan/atau kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung;

3. Hasil Rapat penilaian Dokumen Evaluasi Lingkungan Hidup usaha dan/atau kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung pada hari Selasa, 24 November 2020 dengan Berita Acara Nomor; 164/KOMDAL/V.10/2020;
4. Hasil Verifikasi perbaikan Dokumen Evaluasi Lingkungan Hidup Usaha dan/atau Kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung dengan Berita Acara Nomor: 172/KOMDAL/ V.10/2020 tanggal 4 Desember 2020 dan dinyatakan telah diperbaiki sesuai arahan oleh Tim Teknis Komisi Penilai Amdal Provinsi Lampung;.

MEMUTUSKAN:

Menetapkan : **KEPUTUSAN DOKUMEN EVALUASI LINGKUNGAN HIDUP USAHA DAN/ATAU KEGIATAN SISTEM IRIGASI WAY SEKAMPUNG DI KABUPATEN PESAWARAN, KABUPATEN LAMPUNG TENGAH, KABUPATEN LAMPUNG TIMUR DAN KOTA METRO PROVINSI LAMPUNG OLEH BALAI BESAR WILAYAH SUNGAI MESUJI SEKAMPUNG.**

KESATU : Dokumen Evaluasi Lingkungan Hidup usaha dan/atau kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung oleh Balai Besar wilayah Sungai Mesuji Sekampung berada di 4 (empat) Kabupaten yang meliputi:

- 1) 26 (Dua Puluh Enam) kecamatan:
 1. Kecamatan Tegineneng;
 2. Kecamatan Gunung Sugih;
 3. Kecamatan Bekri;
 4. Kecamatan Trimurjo;
 5. Kecamatan Bumi Ratu Nuban;
 6. Kecamatan Punggur;
 7. Kecamatan Kota Gajah;
 8. Kecamatan Seputih Raman;
 9. Kecamatan Seputih Banyak;
 10. Kecamatan Way Seputih;
 11. Kecamatan Rumbia;
 12. Kecamatan Batanghari;
 13. Kecamatan Sekampung;
 14. Kecamatan Margatiga;
 15. Kecamatan Sukadana;
 16. Kecamatan Bumi Agung;
 17. Kecamatan Batanghari Nuban;
 18. Kecamatan Pekalongan;
 19. Kecamatan Raman Utara;
 20. Kecamatan Purbolinggo;
 21. Kecamatan Way Bungur;

22. Kecamatan Metro Selatan;
23. Kecamatan Metro Barat;
24. Kecamatan Metro Timur;
25. Kecamatan Metro Pusat;
26. Kecamatan Metri Utara;
- 2) Luas lahan 55.373 ha;
- KEDUA : Penerima Keputusan sebagaimana dimaksud pada Diktum Kesatu sebagai penanggung jawab melakukan pengelolaan dan pemantauan terhadap sumber dampak kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Kabupaten Lampung Tengah, Kabupaten Lampung Timur dan Kota Metro Provinsi Lampung pada saat:
- 1) Pengoperasian bendung dan kelengkapannya;
 - 2) Pemeliharaan bendung dan kelengkapannya;
 - 3) Pengoperasian jaringan irigasi;
 - 4) Pemeliharaan rutin jaringan irigasi;
 - 5) Pemeliharaan berkala jaringan irigasi;
 - 6) Rehabilitasi jaringan irigasi;
 - 7) Penanggulangan/perbaikan darurat;
- KETIGA : Dokumen Evaluasi Lingkungan Hidup usaha dan/atau kegiatan Sistem Irigasi Way Sekampung Di Kabupaten Pesawaran, Lampung Tengah, Lampung Timur dan Kota Metro Provinsi Lampung, sebagaimana dimaksud dalam diktum KESATU, digunakan sebagai acuan dalam pelaksanaan pengelolaan lingkungan hidup dan pemantauan lingkungan hidup.
- KEEMPAT : Balai Besar wilayah Sungai Mesuji Sekampung sebagai penanggung jawab usaha dan/atau kegiatan wajib melaporkan hasil pelaksanaan pengelolaan lingkungan hidup dan pemantauan lingkungan hidup setiap 6 (enam) bulan sekali kepada:
- a. Menteri Lingkungan Hidup dan Kehutanan Republik Indonesia;
 - b. Gubernur Lampung;
 - c. Pusat Pengendalian Pembangunan Ekoregion Sumatera;
 - d. Dinas Lingkungan Hidup Provinsi Lampung;
 - e. Dinas Lingkungan Hidup Kabupaten Pesawaran;
 - f. Dinas Lingkungan Hidup Kabupaten Lampung Tengah;
 - g. Dinas Lingkungan Hidup Kabupaten Lampung Timur;
 - h. Dinas Lingkungan Hidup Kota Metro.
- KELIMA : Instansi pemberi izin wajib mencantumkan persyaratan dan kewajiban yang tercantum dalam Keputusan Kepala Dinas Lingkungan Hidup Provinsi Lampung ini serta Dokumen Evaluasi Lingkungan Hidup (DELH) sebagai ketentuan dalam izin melakukan usaha dan/atau kegiatan Sistem Irigasi Way Sekampung Di Kabupaten Pesawaran, Lampung Tengah, Lampung Timur dan Kota Metro Provinsi Lampung.
- KEENAM : Sebagai pelaksanaan fungsi pengawasan terhadap Dokumen Evaluasi Lingkungan Hidup (DELH) usaha dan/atau kegiatan Sistem Irigasi Way Sekampung di Kabupaten Pesawaran, Lampung Tengah, Lampung Timur dan Kota Metro Provinsi Lampung, maka Dinas Lingkungan Hidup Provinsi Lampung, Dinas Lingkungan Hidup Kabupaten Pesawaran, Dinas Lingkungan Hidup Kabupaten Lampung

Tengah, Dinas Lingkungan Hidup Kabupaten Lampung Timur dan Dinas Lingkungan Hidup Kota Metro setiap saat dapat melakukan pengawasan terhadap ketaatan penanggung jawab usaha dan/atau kegiatan atas kewajiban sebagaimana dimaksud dalam diktum KETIGA.

- KETUJUH : Apabila dikemudian hari timbul dampak lingkungan diluar ketentuan yang tercantum dalam Dokumen Evaluasi Lingkungan Hidup (DELH), pemrakarsa wajib melaporkan kepada instansi sebagaimana dimaksud pada diktum KEEMPAT;
- KEDELAPAN : Keputusan ini mulai berlaku pada tanggal ditetapkan dengan ketentuan apabila dikemudian hari ternyata terdapat kekeliruan dalam Keputusan ini akan diadakan pembetulan sebagaimana mestinya

Ditetapkan di Telukbetung
pada tanggal 10 Desember 2020
KEPALA DINAS LINGKUNGAN HIDUP
PROVINSI LAMPUNG,



SYAHRUDIN PUTERA. S. Sos. MM
Pembina Utama Madya
NIP.19711009 199803 1 009

Tembusan:

1. Menteri Lingkungan Hidup dan Kehutanan RI di Jakarta;
2. Gubernur Lampung di Telukbetung;
3. Kepala Pusat Pengendalian Pembangunan Ekoregion Sumatera. di Pekanbaru;
4. Dinas Lingkungan Hidup Kabupaten Pesawaran di Kedondong;
5. Dinas Lingkungan Hidup Kabupaten Lampung Tengah di Gunung Sugih;
6. Dinas Lingkungan Hidup Kabupaten Lampung Timur di Sukadana;
7. Dinas Lingkungan Hidup Kota Metro di Metro.

REA Checklist

IRRIGATION

Punggur Utara Sub-system

Country/Project Title: Indonesia/Project Preparation Consultant Way Sekampung Irrigation System

Name of the respondents: Sutrimo, WUAF

Name of the visited area:

- Village: Toto Katon
- Sub- district: Punggur
- District/City: Central Lampung

Reminder:

- The checklist is to be prepared to support the environmental classification of a project.
- Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.
- Carry a map of Protected Area.
- Carry a camera.

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Protected Area		✓	Location of the project area is not adjacent to or within any of the following protected forest. 1. Way Waya Gunung Tanggamus located in Lampung Tengah and Tanggamus Districts with a distance 30 km from project area. 2. Pematang Neba located in Tanggamus District with a distance 53 km from project area.
▪ Wetland		✓	Not within or adjacent to the Project area.
▪ Mangrove		✓	Not within or adjacent to the Project area. The coastal (mangrove) area is located more than 40 km from the Project area.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ Estuarine		✓	Not within or adjacent to the Project area. The coastal (estuarine) area is located more than 40 km from the Project area.
▪ Buffer zone of protected area		✓	Not within or adjacent to the buffer zone of protected area.
▪ Special area for protecting biodiversity		✓	Based on the discussion with <i>Dinas Lingkungan Hidup</i> /Environmental Agency, Lampung Province, there is Liwa Botanical Garden (<i>Kebun Raya Liwa/KRL</i>), however it is located in Lampung Barat District with a distance 120 km from the Project area.
B. Potential Environmental Impacts Will the Project cause...			
▪ loss of precious ecological values (e.g. result of encroachment into forests/swamplands or historical/cultural buildings/areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)?		✓	Works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.
▪ conflicts in water supply rights related social conflicts?	✓		During the dry season the distribution of irrigation water is disrupted, due to the reduced amount of water supply to the irrigation area. When two farmers need water at the same time, this can lead to conflict, because they both want very limited water. Farmers should coordination with the water master (ili-ili) to regulate irrigation water flow as needed before use the water.
▪ impediments to movements of people and animals?	✓		Project rehabilitation consist of sediment excavation, defect canal lining demolition and precast/concrete canal lining installation. Temporary stockpiling of sediment and debris on the edge of the canals which adjacent to the public roads (before transported by dump trucks to the disposal site) will obstruct the traffic of people and animals. Debris/demolition wastes are needed by the local people to filled up earth roads, yard and others. Installs safety line (barricade) around the storage area, traffic signs and lighting and assign the flagmen to arrange traffic are required.
▪ potential ecological problems due to increased soil erosion and		✓	According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015 are classified

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
siltation, leading to decreased stream capacity?			into erosion level I (very light). The classification consists of I (very light), II (light), III (moderate), IV (heavy) and V (very heavy). No ecological value in leading to decreased stream capacity
▪ Insufficient drainage leading to salinity intrusion?		✓	Not applicable. Project area is located more than 40 km from coastal area.
▪ over pumping of groundwater, leading to salinization and ground subsidence?		✓	Not applicable. This project is surface water irrigation.
▪ impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water?		✓	There is no rehabilitation/modernization activity in the river body. Activity is carried out in the canal, both primary and secondary canals. The sequence of work is as follows: a) stoppage temporarily of irrigation water before carrying out the work. before carrying out the work. The Cropping Season adjusts to the work schedule, b) implementation of work to the completion, c) clean up the used material/remnants of work from the irrigation canals and d) irrigation water flow is opened.
▪ dislocation or involuntary resettlement of people?		✓	The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not dislocate any person, therefore no involuntary resettlement of people.
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	Lampung ethnic group consists of two indigenous groups, namely Lampung Saibatin and Lampung Pepadun. The area of Lampung Saibatin originally is located around the coast while the Pepadun is inland and hinterland, however that Indigenous People are found surrounding the project area in Punggur Sub-district. They work as farmers, teachers and merchants. No disproportionate impact on Indigenous Peoples or other vulnerable groups with considering that the works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.
▪ potential social conflicts arising from land tenure and land use issues?		✓	The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site, therefore no potential social conflicts arising from land tenure and land use issues.
▪ soil erosion before compaction and lining of canals?		✓	Soil erosion before compaction and lining of canals would be minimum.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																		
			<p>The sequence of work is as follows: a) stoppage temporarily of irrigation water before implementation of the work, b) demolition of existing canal lining and land clearing for earth secondary canals, c) compaction of canals, d) lining of canal is implemented after compaction of the canal is completed along 100 m, e) clean up the used material/remnants of work from the irrigation canals, and f) irrigation water flow is opened.</p>																		
▪ noise from construction equipment?	✓		<p>Heavy equipment noise emission levels and the quantity are tabulated below:</p> <table border="1"> <thead> <tr> <th>Equipment</th><th>L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560</th><th>Unit</th></tr> </thead> <tbody> <tr> <td>Dump Truck</td><td>84</td><td>7</td></tr> <tr> <td>Excavator</td><td>85</td><td>4</td></tr> <tr> <td>Crane</td><td>85</td><td>22</td></tr> <tr> <td>Generator</td><td>82</td><td>10</td></tr> <tr> <td>Jackhammer*</td><td>85</td><td>13</td></tr> </tbody> </table> <p>* There are 82 dBA @ 7 meter rated jackhammers (90 lb. class) available. This would be equivalent to 74 dBA @ 50 ft. These are silenced with molded intricate muffler tools.</p> <p>Source:</p> <ul style="list-style-type: none"> ○ Federal Highway Administration, U.S. Department of Transportation. ○ Draft Feasibility Study Report, July 2020. <p>Workers with a full-shift average exposure above 85 dBA are required to wear hearing protection devices (either earplugs or earmuffs).</p> <p>This hearing damage can result from repeated exposure to levels above 85 dBA (such as years of working around construction noise without hearing protection).</p> <p>Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, concrete truck mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal) and noise from construction equipment and tools (e.g., dump truck, excavator, crane, jackhammer). Workers in the site are using tools such as: jackhammer, concrete</p>	Equipment	L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560	Unit	Dump Truck	84	7	Excavator	85	4	Crane	85	22	Generator	82	10	Jackhammer*	85	13
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REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>mixer is the most people who are suffering from exposure to construction noise. Also, residents who are living beside the sites of construction works and those who are using the roads near to sites are suffering from the noise of construction.</p> <p>Impacts of noise on human: exposure to prolonged or excessive noise has been shown to cause a range of health problems ranging from stress, poor concentration, productivity losses in the workplace, and communication difficulties and fatigue from lack of sleep, to more serious issues such as cardiovascular disease, cognitive impairment and tinnitus.</p> <p>The preferred way to prevent hearing damage is to reduce noise at its source. However, earplugs and earmuffs will always be necessary for some construction activities.</p> <p>Impacts of noise on wildlife: human-induced noise pollution is one of many factors contributing to the depletion of wildlife populations. Laboratory studies and limited field research have uncovered four major ways in which animals are adversely affected by noise pollution: hearing loss, resulting from noise levels of 85 dBA or greater; masking, which is the inability to hear important environmental cues and animal signals; non-auditory physiological effects, such as increased heart rate and respiration and general stress reaction; and behavioural effects, which vary greatly between species and noise characteristics, resulting in, for example, abandonment of territory and lost reproduction. Studies on Rhesus Monkeys in the laboratory have shown that a 30% increase in blood pressure following exposure to an average 85 dBA (lower at night, higher during the day) for eight months resulted in a permanently higher blood pressure and heart rate even after one month of quiet time! (Nature Sounds Society).</p> <p>Meanwhile, impacts of noise on plant: noise pollution is altering the landscape of plants and trees, which depend on noise-affected animals to pollinate them and spread their seeds. Some plants do worse in noisy areas, a study found, while others seem to do better, depending on how the community of creatures around them changes.</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Activity at night time will be more cause nuisance to the surrounding environment.</p> <p>Impact of noise on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (30 km to 53 km) from the existing protected forest area, therefore, noise from construction activities does not cause negative impacts against animals and plants in the protected forest areas.</p>
▪ dust during construction?	✓		<p>Dust because of vehicles: vehicles entrance and exist to the site is very important task, which generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site, this means that not only the labours will harm, but also the public.</p> <p>Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal/excavation.</p> <p>There are some people exposing and breathing dust every day regardless they are labours, residents, or those who are using roads near to construction sites.</p> <p>Dust pollution is the introduction of particulate matter that cause harm or discomfort to humans or other living organisms, or cause damage to the natural environment.</p> <p>Impacts of dust on human: in fact, dust when inhaled can increase breathing problems, damage lung tissue, and aggravate existing health problems. In addition to health concerns, dust generated from various activities can reduce visibility, resulting in accidents (Division of Genetics and Plant Propagation, India) and impacts of dust on plant: the rate of photosynthesis will decrease if the stomata on the surface of leaves be covered with dust. Therefore, if stomatal pores will be covered, then there will be decline in the process of photosynthesis and ultimately the plant will die due to absence of nutrients.</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Meanwhile, impacts of dust on animals: according to the American Society for the Prevention of Cruelty to Animals (ASPCA), when allergy season hits, dust may affect the health of the pets with suffer the nagging symptom, such as a runny nose, itchy eyes and dry skin.</p> <p>Impact of dust on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (30 km to 53 km) from the existing protected forest area, therefore, dust from construction activities does not cause negative impacts against animals and plants in the protected forest areas.</p> <p>The mitigation measures to minimize the impact, such as (i) regular watering to exposed lands by water tank which the water is taken from the nearest river; (ii) cover the tailgate with tarpaulin or plastic sheet during transporting dispersible materials to and from the site to prevent debris scattered and dust spreads to area surrounding transportation corridor traverses; (iii) the dust content due to demolition of canal lining is minimized by watering the site through water tank which the water is taken from the nearest river ; (iv) and agreement with the local community on the schedule and duration of construction works, (iv) construction workers should wear standard PPE (dust masker).</p>
▪ waterlogging and soil salinization due to inadequate drainage and farm management?	✓		<p>Extraction of materials can disrupt natural land contours and vegetation, resulting in accelerated erosion, disturbance in natural drainage patterns and waterlogging.</p> <p>So far, waterlogging in irrigation area due to reduced drainage capacity has never occurred, because excavation of sediment in the canal is always done periodically. Sediment removal plan annually by machinery in main canal is 2,665 m³, meanwhile sediment removal by man power 1 m depth in secondary canal is 1,142 m³ (Feasibility Study Report, July 2020).</p>
▪ leaching of soil nutrients and changes in soil characteristics due to excessive application of irrigation water?	✓		Farmers saving irrigation water, do not inundate land when planting paddy (transplanting), there is no swift flow of water that transport soil nutrient out of paddy fields.
▪ reduction of downstream water supply during peak seasons?	✓		Reduction of downstream water supply occurred during dry seasons, which the required discharge is insufficient

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																													
			<p>to irrigate the entire irrigation area, so that most of the discharge is flowed into the irrigation area. In this condition, water supply to downstream of the Argoguruh weir is limited.</p> <p>Well water is not sufficient for household needs (washing and bathing) during the dry season. The community fulfills it by utilizing river water downstream of the weir.</p>																													
▪ soil pollution, polluted farm runoff and groundwater, and public health risks due to excessive application of fertilizers and pesticides?	✓		<p>No excessive application of fertilizers and pesticides. Integrated Crop Management (ICM) and Integrated Pest Management (IPM) have been applied by most farmers to use fertilizer according to the need and promote on using organic fertilizer.</p> <p>84 % farmers have applied IPM and 16 % farmers have not yet applied IPM. Meanwhile 88 % farmers have applied ICM and 12 % farmers have not yet applied ICM.</p> <p>Application of ICM and IPM in the field will follow the instruction of PPL (<i>Penyuluhan Pertanian Lapangan</i>/ Field Extension Worker). PPL conducts an extension to the farmers every 2 to 3 weeks.</p> <p>Water quality of Way Sekampung River in downstream area in some locations related to application of fertilizers in Way Sekampung Irrigation System, as follows:</p> <table border="1"> <thead> <tr> <th rowspan="2">Parameter</th> <th>Apr 2009</th> <th>May 2009</th> <th>Jun 2009</th> <th>Water Quality Standard Class IV</th> </tr> <tr> <th colspan="4">mg/L</th> </tr> </thead> <tbody> <tr> <td>Nitrate Nitrogen (NO₃ - N)</td> <td>1.5678</td> <td>0.9716</td> <td>0.6629</td> <td><20</td> </tr> <tr> <td>Nitrite Nitrogen (NO₂ - N)</td> <td>0.1662</td> <td>0.1682</td> <td>0.0131</td> <td>-</td> </tr> <tr> <td>Ammonia (NH₃ - N)</td> <td>0.8113</td> <td>0.5818</td> <td>0.5239</td> <td>-</td> </tr> <tr> <td>Phosphate</td> <td>0.1161</td> <td>0.1467</td> <td>0.2188</td> <td>5</td> </tr> </tbody> </table> <p>Source: BPLHD, Regional Environmental Status Data Book, Lampung Province, 2009</p>	Parameter	Apr 2009	May 2009	Jun 2009	Water Quality Standard Class IV	mg/L				Nitrate Nitrogen (NO ₃ - N)	1.5678	0.9716	0.6629	<20	Nitrite Nitrogen (NO ₂ - N)	0.1662	0.1682	0.0131	-	Ammonia (NH ₃ - N)	0.8113	0.5818	0.5239	-	Phosphate	0.1161	0.1467	0.2188	5
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REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																														
			<p>Measurement in Gunung Raya Village, Sekampung Udk Sub district, East Lampung District.</p> <table border="1"> <thead> <tr> <th>Parameter</th><th>Apr 2009</th><th>May 2009</th><th>Jun 2009</th><th>Water Quality Standard Class IV</th></tr> </thead> <tbody> <tr> <td>Nitrate Nitrogen (NO₃ - N)</td><td>1.115</td><td>1.2169</td><td>0.4887</td><td><20</td></tr> <tr> <td>Nitrite Nitrogen (NO₂ - N)</td><td>0.1319</td><td>0.1319</td><td>0.0124</td><td>-</td></tr> <tr> <td>Ammonia (NH₃ - N)</td><td>0.6432</td><td>0.2756</td><td>0.3206</td><td>-</td></tr> <tr> <td>Phosphate</td><td>0.0974</td><td>0.1244</td><td>0.1999</td><td>5</td></tr> </tbody> </table> <p>Source: BPLHD, Regional Environmental Status Data Book, Lampung Province, 2009</p> <p>Measurement in Margo Toto Village, Metro Kibang Sub District, South Lampung District.</p> <p>According to the contents of Nitrate Nitrogen, Nitrite Nitrogen, Ammonia and Phosphate showed still far below the standard.</p>	Parameter	Apr 2009	May 2009	Jun 2009	Water Quality Standard Class IV	Nitrate Nitrogen (NO ₃ - N)	1.115	1.2169	0.4887	<20	Nitrite Nitrogen (NO ₂ - N)	0.1319	0.1319	0.0124	-	Ammonia (NH ₃ - N)	0.6432	0.2756	0.3206	-	Phosphate	0.0974	0.1244	0.1999	5					
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✓	According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015, the Project area is classified into erosion level I (very light). The classification: I (very light), II (light), III (moderate), IV (heavy) and V (very heavy).																																
✓	No scouring canals. Canal slope with concrete lining along the feeder canals and primary canals, meanwhile canals slope and canal bed with concrete lining along the secondary canals. The canal gradient 0.0003 and flow velocity 0.5 m/sec to 1.4 m/sec appropriate with the design standards (Feasibility Study Report, July 2020).																																
✓	Sedimentation occurs at the ends of primary and secondary canals, because water flow slows down and even stops when the water gates are clogged by sediment / rubbish.																																
✓	Coordination with the water master (Ili-ili) or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.																																
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REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>even stops when the water gates are clogged by weed (water hyacinth).</p> <p>Coordination with the water master (Ili-ili) or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.</p>
▪ seawater intrusion into downstream freshwater systems?		✓	<p>Not applicable.</p> <p>Irrigation area not located in coastal area.</p>
▪ introduction of increase in incidence of waterborne or water related diseases?		✓	<p>Information collected from Public Health Centre related is a matter of household sanitation, clean water sources, Public Health Centre programs, and free defecation programs conducted with village offices and the top 10 diseases in one year based on the number of patient visits. Water-borne diseases that enter the top ten are dominated by diarrhoea and dermatitis. At the top, it is dominated by airborne diseases such as upper respiratory tract infection. However, non-infectious diseases have started to move up in the top ten.</p> <p>A pre-formulated questionnaire was used to interview respondents containing questions about personal data, characteristics of farmers, duration of contact with irrigation water, use of pesticides and fertilizers, use of personal protective equipment, availability of clean water and household sanitation. The survey was conducted in a sample of 31 villages and 210 farmer interviews which form the sample for assessing community health in the Way Sekampung Irrigation System.</p> <p>Waterborne diseases occur due to poor hygiene, household sanitation and bad quality of clean water sources. These diseases can be transmitted by waterborne, such as diarrhoea, dysentery, cholera, polio, typhoid, hepatitis, meningitis. Interviewing farmers indicated low levels of waterborne diseases within the Way Sekampung Irrigation System. It is noted that one farmer was infected with dengue fever, one person suffered diarrhoea, and one person had typhoid and 8 person's dermatitis. In total, this amounts to only 5% of the sample. Other infectious diseases that occur anecdotal are cough, flu, and fever. The amount is 2% of the sample. Non-infectious diseases reported are rheumatic pain, headache, and gastritis, for 6% of the sample. Non-infectious diseases have been shifting to the top ten diseases in Way Sekampung Irrigation</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> ▪ dangers to a safe and healthy working environment due to physical, chemical and biological hazards during project construction and operation? 	✓		<p>System (Feasibility Study Report, Development of Way Sekampung Irrigation System, Supplement I Public Health Report, July 2020).</p> <p>No chemical and biological materials used during project construction and operation.</p> <p>Dangers to a safe and healthy working environment due to hazards during project construction, such as:</p> <ul style="list-style-type: none"> - Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the workers. - Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site will harm the labours. - Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal. - There are some people exposing and breathing dust every day regardless they are labours of construction work. - Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction tools (e.g., jackhammer). Workers in the site are using equipment and tools such as: dump truck, excavator, crane, jackhammer and concrete mixer are the most people who are suffering from exposure to construction noise. - Workers in the site are using jackhammer are suffering from exposure to construction vibration. - Installation of precast canal lining in primary canal by the crane. The movement of workers in the canal (right and left sides) by passing the ladder placed on the slope of the canal. Average height of primary canals is 6.0 m. Placement of the ladder on unstable

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>site may cause the ladder to collapse and worker to fall.</p> <ul style="list-style-type: none"> - Meanwhile, the installation of concrete canal lining in the secondary canal by a Concrete Truck Mixer. Movement of workers in the canal (right and left sides) by crossing temporary pedestrian bridge placed on both sides of the canal. Average height of secondary canals is 2.5 m. Placement of the bridge at a fragile location, not strong bridge material and the absence of a hand rail may cause to collapse of the bridge and the fall of passing workers. - Workers should wear standard PPE (helmet, gloves /vibration-damping gloves, safety boots, ear protection and face protection). <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area.</p> <p>Some locations will be occupied for Base camp, warehouse, fuel tank and heavy equipment parking for project rehabilitation.</p> <p>Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response plan and evacuation route should be provided.</p>
<ul style="list-style-type: none"> ▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)? 	✓		<p>Total workforce during project rehabilitation is 820 persons, which around 75% of the total workforce as unskilled labourers employed from surrounding residents and they will live in their respective homes, therefore there are not any a large population influx. Recruits local labour profusely.</p> <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area. This condition not likely to causes increased burden on social infrastructure and services (such as water supply and sanitation systems).</p>
<ul style="list-style-type: none"> ▪ social conflicts if workers from other regions or countries are hired? 	✓		<p>Many unskilled workers, bricklayer, drivers and securities are available for project construction in surrounding project area.</p> <p>Priority for local workers.</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	✓		<p>There is no transport, storage, and use and/or disposal of materials such as explosives and other chemicals during construction and operation.</p> <p>Risks to community health and safety due to the transport, storage, and use and/or disposal of materials during construction, such as:</p> <ul style="list-style-type: none"> - Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dusts out the site will harm the public. - Dust because of construction activities: the majority of construction activities causes an effect on the environment, due to generates amount of dust. Project location is adjacent to residential area. These activities such as canal lining demolition and sediment removal/excavation. - There are some people exposing and breathing dust every day regardless they are residents, or those who are using roads near to construction sites. - Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction equipment and tools (e.g., dump truck, excavator, crane, jackhammer). Residents who are living beside the sites of construction works and those who are using the roads near to sites are suffering from the noise of construction. - Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the residents, which staying in the transportation corridor traverses by construction vehicles. - No hazardous waste. No painting work. Painting irrigation gates and other structures is undertaken by fabrication. - Handling oil spills from vehicle, etc. with the following steps:

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ Sprinkle sawdust or coconut husks,○ Allow the absorbent material to work on the oil for 24 to 48 hours,○ Repeat with fresh absorbent material as needed to remove any remaining oil.- Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response and evacuation route should be provided. <p>The Covid-19 prevention procedures for workers and community surrounding the project:</p> <ol style="list-style-type: none">1. Administrative Controls <p>Use administrative controls, when feasible, to reduce or eliminate the risk of exposure, such as training for construction workers on the spread of the disease in the geographic areas in which they work.</p> <ul style="list-style-type: none">▪ The signs and symptoms of Covid-19 and an explanation of how the disease is potentially spread, including the fact that infected people can spread the virus even if they do not have symptoms.▪ All policies and procedures that are applicable to the employee's duties as they relate to potential exposures to Covid-19. It is helpful to provide employees with a written copy of those standard operating procedures.▪ Information on appropriate social distancing and hygiene practices, including:<ul style="list-style-type: none">○ Avoiding physical contact with others and maintaining a distance of at least 6 feet (~ 2 m) from customers and other individuals, whenever possible, including inside work trailers.○ Appropriate cleaning practices (i.e., washing hands frequently with soap and water for at least 20 seconds, or, if soap and water are not immediately available, using alcohol-based hand sanitizer that contains at least 60% alcohol and rubbing hands until they are dry; sanitizing all surfaces workers will touch).○ The proper way to cover coughs and sneezes (i.e., sneezing or coughing into a tissue or into the upper sleeve).

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ Alternatives to shaking hands upon entry, and the importance of workers not touching their own faces (mouth, nose, eyes).○ The benefits of driving to work sites or parking areas individually, when possible, without passengers or carpools.▪ The types, proper use, limitations, location, handling, decontamination, removal, and disposal of any PPE being used.▪ The importance of staying home if they are sick.▪ Wearing masks over their noses and mouths to prevent them from spreading the virus.▪ The need to continue using other normal control measures, including PPE, necessary to protect workers from other job hazards associated with construction activities.▪ Using cleaning chemicals that have label claims against the coronavirus for cleaning frequently touched surfaces like tools, handles, and machines.▪ The need to report any safety and health concerns. <p>2. Safe Work Practices</p> <ul style="list-style-type: none">▪ To the extent possible, screen all visitors including community surrounding the project on all construction sites in advance of their arrival on the job site for signs and symptoms of Covid-19.▪ Adopt staggered work schedules, e.g., provide alternating workdays or extra shifts, to reduce the total number of employees on a job site at any given time and to ensure physical distancing.▪ Identify choke points where workers are forced to stand together, such as hallways, hoists and elevators, ingress and egress points, break areas, and buses, and implement policies to maintain social distancing.▪ Institute a rigorous housekeeping program to reduce dust levels on the job site.▪ Keep in-person meetings (including toolbox talks and safety meetings) as short as possible, limit the number of workers in attendance, and use social distancing practices.▪ Ensure clean toilet and handwashing facilities. Clean and disinfect portable job site toilets regularly. Fill hand sanitizer dispensers regularly. Disinfect frequently touched items (i.e., door pulls and toilet seats) regularly.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Source: Covid-19 Control and Prevention/ Construction Work, OSHA, United States Department of Labor.</p> <p>Watering on the road that is passed by dump trucks in a residential area periodically and limits the vehicle speed does not exceed 40 km / h when passing the area.</p> <p>Assign the flagman on roads which are often jammed by project vehicles</p> <p>Mitigation measures: Management System on Community Health and Safety should be applied and monitored during construction and operation.</p> <p>Wearing standard Personal Protection Equipment (PPE).</p>
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	✓		Argoguruh weir is not accessible to members of the affected community throughout project construction, operation and decommissioning. There is no rehabilitation work at Argoguruh weir and around the weir is fenced and padlocked. Based on the explanation in remarks above then it is should be no community safety risks due to both accidental and natural hazards.

REA Checklist

IRRIGATION

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: Indonesia/Project Preparation Consultant Way Sekampung Irrigation System

Sector :

Subsector:

Screening Questions		Score	Remarks¹
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	1	Landslide
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.)?	2	Topographical & geological condition
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	1	Heavy rain, floods
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): Medium risk

Other Comments: The Way Sekampung system has been established so long time with only minor risk to the performance of infrastructures,

The climate change will affect the productivity of paddy or other crops later in the far future

Prepared by: Kushartanto – Environment Specialist, Abidin Hadiarto - Irrigation Planning Design Specialist and Francois Kresno P - Assistant Hydraulic Modeling System.

¹ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

REA Checklist

IRRIGATION

Rumbia Barat Sub-system

Country/Project Title: Indonesia/Project Preparation Consultant Way Sekampung Irrigation System

Name of the respondents: Kastu, WUAF

Name of the visited area:

- Village: Sumber Baru
- Sub- district: Seputih Banyak
- District/City: Central Lampung

Reminder:

- o The checklist is to be prepared to support the environmental classification of a project.
- o Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.
- o Carry a map of Protected Area.
- o Carry a camera.

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Protected Area		✓	Location of the project area is not adjacent to or within any of the following protected forest. 1. Way Kambas National Park located in Lampung Timur District with a distance 25 km from project area. 2. Way Waya Gunung Tanggamus located in Lampung Tengah and Tanggamus Districts with a distance 65 km from project area.
▪ Wetland		✓	Not within or adjacent to the Project area.
▪ Mangrove		✓	Not within or adjacent to the Project area. The coastal (mangrove) area is located more than 40 km from the Project area.
▪ Estuarine		✓	Not within or adjacent to the Project area. The coastal (estuarine) area is located more than 40 km from the Project area.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ Buffer zone of protected area		✓	Not within or adjacent to the buffer zone of protected area.
▪ Special area for protecting biodiversity		✓	Based on the discussion with <i>Dinas Lingkungan Hidup</i> /Environmental Agency, Lampung Province, there is Liwa Botanical Garden (<i>Kebun Raya Liwa/KRL</i>), however it is located in Lampung Barat District with a distance 120 km from the Project area.
B. Potential Environmental Impacts Will the Project cause...			
▪ loss of precious ecological values (e.g. result of encroachment into forests/ swampland or historical/ cultural buildings/ areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)?		✓	Works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.
▪ conflicts in water supply rights related social conflicts?	✓		During the dry season the distribution of irrigation water is disrupted, due to the reduced amount of water supply to the irrigation area. When two farmers need water at the same time, this can lead to conflict, because they both want very limited water. Farmers should coordination with the water master (<i>Illi-ili</i>) to regulate irrigation water flow as needed before use the water.
▪ impediments to movements of people and animals?	✓		Project rehabilitation consist of sediment excavation, defect canal lining demolition and precast/concrete canal lining installation. Temporary stockpiling of sediment and debris on the edge of the canals which adjacent to the public roads (before transported by dump trucks to the disposal site) will obstruct the traffic of people and animals. Debris/demolition wastes are needed by the local people to filled up earth roads, yard and others. Installs safety line (barricade) around the storage area, traffic signs and lighting and assign the flagmen to arrange traffic are required.
▪ potential ecological problems due to increased soil erosion and siltation, leading to decreased stream capacity?	✓		According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015 are classified into erosion level I (very light). The classification consists of I (very light), II (light), III (moderate), IV (heavy) and V (very heavy).

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			No ecological value in leading to decreased stream capacity.
▪ Insufficient drainage leading to salinity intrusion?	✓		Not applicable. Project area is located more than 55 km from coastal area.
▪ over pumping of groundwater, leading to salinization and ground subsidence?	✓		Not applicable. This project is surface water irrigation.
▪ impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water?		✓	<p>There is no rehabilitation/modernization activity in the river body. Activity is carried out in the canals, both primary and secondary canals.</p> <p>The sequence of work is as follows: a) stoppage temporarily of irrigation water before carrying out the work. before carrying out the work. The Cropping Season adjusts to the work schedule, b) implementation of work to the completion, c) clean up the used material/remnants of work from the irrigation canals and d) irrigation water flow is opened.</p>
▪ dislocation or involuntary resettlement of people?		✓	The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not dislocate any person, therefore no involuntary resettlement of people.
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	<p>Lampung ethnic group consists of two indigenous groups, namely Lampung Saibatin and Lampung Pepadun. The area of Lampung Saibatin originally is located around the coast while the Pepadun is inland and hinterland, however that Indigenous People are not found surrounding the project area in Seputih Banyak Sub-district.</p> <p>No disproportionate impact on Indigenous Peoples or other vulnerable groups with considering that the works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.</p>
▪ potential social conflicts arising from land tenure and land use issues?		✓	The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site, therefore no potential social conflicts arising from land tenure and land use issues.
▪ soil erosion before compaction and lining of canals?		✓	<p>Soil erosion before compaction and lining of canals would be minimum.</p> <p>The sequence of work is as follows: a) stoppage temporarily of irrigation water before implementation of the work, b) demolition of existing canal lining and</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																		
			<p>land clearing for earth secondary canals, c) compaction of canals, d) lining of canal is implemented after compaction of the canal is completed along 100 m, e) clean up the used material/remnants of work from the irrigation canals, and f) irrigation water flow is opened.</p>																		
▪ noise from construction equipment?	✓		<p>Heavy equipment noise emission levels and the quantity are tabulated below:</p> <table border="1"> <thead> <tr> <th>Equipment</th><th>L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560</th><th>Unit</th></tr> </thead> <tbody> <tr> <td>Dump Truck</td><td>84</td><td>4</td></tr> <tr> <td>Excavator</td><td>85</td><td>4</td></tr> <tr> <td>Crane</td><td>85</td><td>1</td></tr> <tr> <td>Generator</td><td>82</td><td>1</td></tr> <tr> <td>Jackhammer*</td><td>85</td><td>1</td></tr> </tbody> </table> <p>* There are 82 dBA @ 7 meter rated jackhammers (90 lb. class) available. This would be equivalent to 74 dBA @ 50 ft. These are silenced with molded intricate muffler tools.</p> <p>Source:</p> <ul style="list-style-type: none"> ○ Federal Highway Administration, U.S. Department of Transportation. ○ Draft Feasibility Study Report, July 2020. <p>Workers with a full-shift average exposure above 85 dBA are required to wear hearing protection devices (either earplugs or earmuffs).</p> <p>This hearing damage can result from repeated exposure to levels above 85 dBA (such as years of working around construction noise without hearing protection).</p> <p>Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, concrete truck mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal) and noise from construction equipment and tools (e.g., dump truck, excavator, crane, jackhammer). Workers in the site are using tools such as: jackhammer, concrete mixer is the most people who are suffering from exposure to construction noise. Also, residents who are living beside the sites of construction works and those</p>	Equipment	L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560	Unit	Dump Truck	84	4	Excavator	85	4	Crane	85	1	Generator	82	1	Jackhammer*	85	1
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REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>who are using the roads near to sites are suffering from the noise of construction.</p> <p>Impacts of noise on human: exposure to prolonged or excessive noise has been shown to cause a range of health problems ranging from stress, poor concentration, productivity losses in the workplace, and communication difficulties and fatigue from lack of sleep, to more serious issues such as cardiovascular disease, cognitive impairment and tinnitus.</p> <p>The preferred way to prevent hearing damage is to reduce noise at its source. However, earplugs and earmuffs will always be necessary for some construction activities.</p> <p>Impacts of noise on wildlife: human-induced noise pollution is one of many factors contributing to the depletion of wildlife populations. Laboratory studies and limited field research have uncovered four major ways in which animals are adversely affected by noise pollution: hearing loss, resulting from noise levels of 85 dBA or greater; masking, which is the inability to hear important environmental cues and animal signals; non-auditory physiological effects, such as increased heart rate and respiration and general stress reaction; and behavioural effects, which vary greatly between species and noise characteristics, resulting in, for example, abandonment of territory and lost reproduction. Studies on Rhesus Monkeys in the laboratory have shown that a 30% increase in blood pressure following exposure to an average 85 dBA (lower at night, higher during the day) for eight months resulted in a permanently higher blood pressure and heart rate even after one month of quiet time! (Nature Sounds Society).</p> <p>Meanwhile, impacts of noise on plant: noise pollution is altering the landscape of plants and trees, which depend on noise-affected animals to pollinate them and spread their seeds. Some plants do worse in noisy areas, a study found, while others seem to do better, depending on how the community of creatures around them changes.</p> <p>Activity at night time will be more cause nuisance to the surrounding environment.</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Impact of noise on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (25 km to 65 km) from the existing protected forest area, therefore, noise from construction activities does not cause negative impacts against animals and plants in the national park and protected forest areas.</p>
▪ dust during construction?	✓		<p>Dust because of vehicles: vehicles entrance and exist to the site is very important task, which generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site, this means that not only the labours will harm, but also the public.</p> <p>Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal/excavation.</p> <p>There are some people exposing and breathing dust every day regardless they are labours, residents, or those who are using roads near to construction sites.</p> <p>Dust pollution is the introduction of particulate matter that cause harm or discomfort to humans or other living organisms, or cause damage to the natural environment.</p> <p>Impacts of dust on human: in fact, dust when inhaled can increase breathing problems, damage lung tissue, and aggravate existing health problems. In addition to health concerns, dust generated from various activities can reduce visibility, resulting in accidents (Division of Genetics and Plant Propagation, India) and impacts of dust on plant: the rate of photosynthesis will decrease if the stomata on the surface of leaves be covered with dust. Therefore, if stomatal pores will be covered, then there will be decline in the process of photosynthesis and ultimately the plant will die due to absence of nutrients.</p> <p>Meanwhile, impacts of dust on animals: according to the American Society for the Prevention of Cruelty to</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Animals (ASPCA), when allergy season hits, dust may affect the health of the pets with suffer the nagging symptom, such as a runny nose, itchy eyes and dry skin.</p> <p>Impact of dust on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (25 km to 65 km) from the existing protected forest area, therefore, dust from construction activities does not cause negative impacts against animals and plants in the national park and protected forest areas.</p> <p>The mitigation measures to minimize the impact, such as (i) regular watering to exposed lands by water tank which the water is taken from the nearest river; (ii) cover the tailgate with tarpaulin or plastic sheet during transporting dispersible materials to and from the site to prevent debris scattered and dust spreads to area surrounding transportation corridor traverses; (iii) the dust content due to demolition of canal lining is minimized by watering the site through water tank which the water is taken from the nearest river ; (iv) and agreement with the local community on the schedule and duration of construction works, (iv) construction workers should wear standard PPE (dust masker).</p>
▪ waterlogging and soil salinization due to inadequate drainage and farm management?	✓		<p>Extraction of materials can disrupt natural land contours and vegetation, resulting in accelerated erosion, disturbance in natural drainage patterns and waterlogging.</p> <p>So far, waterlogging in irrigation area due to reduced drainage capacity has never occurred, because excavation of sediment in the canal is always done periodically. Sediment removal plan annually by machinery in main canal is 2,900 m³, meanwhile sediment removal by man power 1 m depth in secondary canal is 420 m³ (Draft Feasibility Study Report, July 2020).</p>
▪ leaching of soil nutrients and changes in soil characteristics due to excessive application of irrigation water?	✓		Farmers saving irrigation water, do not inundate land when planting paddy (transplanting), there is no swift flow of water that transport soil nutrient out of paddy fields.
▪ reduction of downstream water supply during peak seasons?	✓		Reduction of downstream water supply occurred during dry seasons, which the required discharge is insufficient to irrigate the entire irrigation area, so that most of the discharge is flowed into the irrigation area. In this

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																																					
			<p>condition, water supply to downstream of the Argoguruh weir is limited.</p> <p>However, the case did not continue until the conflict.</p>																																					
<ul style="list-style-type: none"> ▪ soil pollution, polluted farm runoff and groundwater, and public health risks due to excessive application of fertilizers and pesticides? 	√		<p>No excessive application of fertilizers and pesticides. Integrated Crop Management (ICM) and Integrated Pest Management (IPM) have been applied by most farmers to use fertilizer according to the need and promote on using organic fertilizer.</p> <p>57 % farmers have applied IPM and 43 % farmers have not yet applied IPM. Meanwhile 86 % farmers have applied ICM and 14 % farmers have not yet applied ICM.</p> <p>Application of ICM and IPM in the field will follow the instruction of PPL (<i>Penyuluhan Pertanian Lapangan</i>/ Field Extension Worker). PPL conducts an extension to the farmers every 2 to 3 weeks.</p> <p>Water quality of Way Sekampung River in downstream area in some locations related to application of fertilizers in Way Sekampung Irrigation System, as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Parameter</th> <th>Apr 2009</th> <th>May 2009</th> <th>Jun 2009</th> <th>Water Quality Standard Class IV</th> </tr> <tr> <th colspan="4">mg/L</th> </tr> </thead> <tbody> <tr> <td>Nitrate Nitrogen (NO₃ - N)</td> <td>1.5678</td> <td>0.9716</td> <td>0.6629</td> <td><20</td> </tr> <tr> <td>Nitrite Nitrogen (NO₂ - N)</td> <td>0.1662</td> <td>0.1682</td> <td>0.0131</td> <td>-</td> </tr> <tr> <td>Ammonia (NH₃ - N)</td> <td>0.8113</td> <td>0.5818</td> <td>0.5239</td> <td>-</td> </tr> <tr> <td>Phosphate</td> <td>0.1161</td> <td>0.1467</td> <td>0.2188</td> <td>5</td> </tr> </tbody> </table> <p>Source: BPLHD, Regional Environmental Status Data Book, Lampung Province, 2009</p> <p>Measurement in Gunung Raya Village, Sekampung Udk Sub district, East Lampung District.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Parameter</th> <th>Apr 2009</th> <th>May 2009</th> <th>Jun 2009</th> <th>Water Quality</th> </tr> </thead> </table>				Parameter	Apr 2009	May 2009	Jun 2009	Water Quality Standard Class IV	mg/L				Nitrate Nitrogen (NO ₃ - N)	1.5678	0.9716	0.6629	<20	Nitrite Nitrogen (NO ₂ - N)	0.1662	0.1682	0.0131	-	Ammonia (NH ₃ - N)	0.8113	0.5818	0.5239	-	Phosphate	0.1161	0.1467	0.2188	5	Parameter	Apr 2009	May 2009	Jun 2009	Water Quality
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REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks				
						Standard Class IV	
			Nitrate Nitrogen (NO ₃ - N)	1.115	1.2169	0.4887	<20
			Nitrite Nitrogen (NO ₂ - N)	0.1319	0.1319	0.0124	-
			Ammonia (NH ₃ - N)	0.6432	0.2756	0.3206	-
			Phosphate	0.0974	0.1244	0.1999	5
			Source: BPLHD, Regional Environmental Status Data Book, Lampung Province, 2009				
			Measurement in Margo Toto Village, Metro Kibang Sub District, South Lampung District.				
			According to the contents of Nitrate Nitrogen, Nitrite Nitrogen, Ammonia and Phosphate showed still far below the standard.				
▪ soil erosion (furrow, surface)?		✓	According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015, the Project area is classified into erosion level I (very light). The classification: I (very light), II (light), III (moderate), IV (heavy) and V (very heavy).				
▪ scouring canals?		✓	No scouring canals. Canal slope with concrete lining along the feeder canals and primary canals, meanwhile canals slope and canal bed with concrete lining along the secondary canals. The canal gradient 0.0003 and flow velocity 0.5 m/sec to 1.4 m/sec appropriate with the design standards (Draft Feasibility Study Report, July 2020).				
▪ clogging of canals by sediments?	✓		Sedimentation occurs at the ends of primary and secondary canals, because water flow slows down and even stops when the water gates are clogged by sediment / rubbish. Coordination with the water master (Ili-ili) or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.				

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ clogging of canals by weeds?	✓		<p>Sedimentation occurs at the ends of primary and secondary canals, because water flow slows down and even stops when the water gates are clogged by weed (water hyacinth).</p> <p>Coordination with the water master (Ili-ili) or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.</p>
▪ seawater intrusion into downstream freshwater systems?		✓	<p>Not applicable. Irrigation area not located in coastal area.</p>
▪ introduction of increase in incidence of waterborne or water related diseases?		✓	<p>Information collected from Public Health Centre related is a matter of household sanitation, clean water sources, Public Health Centre programs, and free defecation programs conducted with village offices and the top 10 diseases in one year based on the number of patient visits. Water-borne diseases that enter the top ten are dominated by diarrhoea and dermatitis. At the top, it is dominated by airborne diseases such as upper respiratory tract infection. However, non-infectious diseases have started to move up in the top ten.</p> <p>A pre-formulated questionnaire was used to interview respondents containing questions about personal data, characteristics of farmers, duration of contact with irrigation water, use of pesticides and fertilizers, use of personal protective equipment, availability of clean water and household sanitation. The survey was conducted in a sample of 31 villages and 210 farmer interviews which form the sample for assessing community health in the Way Sekampung Irrigation System.</p> <p>Waterborne diseases occur due to poor hygiene, household sanitation and bad quality of clean water sources. These diseases can be transmitted by waterborne, such as diarrhoea, dysentery, cholera, polio, typhoid, hepatitis, meningitis. Interviewing farmers indicated low levels of waterborne diseases within the Way Sekampung Irrigation System. It is noted that one farmer was infected with dengue fever, one person suffered diarrhoea, and one person had typhoid and 8 person's dermatitis. In total, this amounts to only 5% of the sample. Other infectious diseases that occur anecdotal are cough, flu, and fever. The amount is 2% of the sample. Non-infectious diseases reported are rheumatic pain, headache, and gastritis, for 6% of the sample. Non-infectious diseases have been shifting to</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>the top ten diseases in Way Sekampung Irrigation System (Draft Feasibility Study Report, Supplement I Public Health Report, July 2020).</p>
▪ dangers to a safe and healthy working environment due to physical, chemical and biological hazards during project construction and operation?	✓		<p>No chemical and biological materials used during project construction and operation.</p> <p>Dangers to a safe and healthy working environment due to hazards during project construction, such as:</p> <ul style="list-style-type: none"> - Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the workers. - Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dusts out the site will harm the labours. - Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal. - There are some people exposing and breathing dust every day regardless they are labours of construction work. - Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction tools (e.g., jackhammer). Workers in the site are using equipment and tools such as: dump truck, excavator, crane, jackhammer and concrete mixer are the most people who are suffering from exposure to construction noise. - Workers in the site are using jackhammer are suffering from exposure to construction vibration. - Installation of precast canal lining in primary canal by the crane. The movement of workers in the canal (right and left sides) by passing the ladder placed on the slope of the canal. Average height of primary canals is 6.0 m. Placement of the ladder on unstable

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>site may cause the ladder to collapse and worker to fall.</p> <ul style="list-style-type: none"> - Meanwhile, the installation of concrete canal lining in the secondary canal by a Concrete Truck Mixer. Movement of workers in the canal (right and left sides) by crossing temporary pedestrian bridge placed on both sides of the canal. Average height of secondary canals is 2.5 m. Placement of the bridge at a fragile location, not strong bridge material and the absence of a hand rail may cause to collapse of the bridge and the fall of passing workers. - Workers should wear standard PPE (helmet, gloves /vibration-damping gloves, safety boots, ear protection and face protection). <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area.</p> <p>Some locations will be occupied for Base camp, warehouse, fuel tank and heavy equipment parking for project rehabilitation.</p> <p>Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response plan and evacuation route should be provided.</p>
<ul style="list-style-type: none"> ▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)? 	✓		<p>Total workforce during project rehabilitation is 197 persons, which around 75% of the total workforce as unskilled labourers employed from surrounding residents and they will live in their respective homes, therefore there are not any a large population influx. Recruits local labour profusely.</p> <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area. This condition not likely to causes increased burden on social infrastructure and services (such as water supply and sanitation systems).</p>
<ul style="list-style-type: none"> ▪ social conflicts if workers from other regions or countries are hired? 	✓		<p>Many unskilled workers, bricklayer, drivers and securities are available for project construction in surrounding project area.</p> <p>Priority for local workers.</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	✓		<p>There is no transport, storage, and use and/or disposal of materials such as explosives and other chemicals during construction and operation.</p> <p>Risks to community health and safety due to the transport, storage, and use and/or disposal of materials during construction, such as:</p> <ul style="list-style-type: none"> - Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site will harm the public. - Dust because of construction activities: the majority of construction activities causes an effect on the environment, due to generates amount of dust. Project location is adjacent to residential area. These activities such as canal lining demolition and sediment removal/excavation. - There are some people exposing and breathing dust every day regardless they are residents, or those who are using roads near to construction sites. - Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction equipment and tools (e.g., dump truck, excavator, crane, jackhammer). Residents who are living beside the sites of construction works and those who are using the roads near to sites are suffering from the noise of construction. - Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the residents, which staying in the transportation corridor traverses by construction vehicles. - No hazardous waste. No painting work. Painting irrigation gates and other structures is undertaken by fabrication. - Handling oil spills from vehicle, etc. with the following steps: <ul style="list-style-type: none"> o Sprinkle sawdust or coconut husks,

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ Allow the absorbent material to work on the oil for 24 to 48 hours,○ Repeat with fresh absorbent material as needed to remove any remaining oil.- Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response and evacuation route should be provided. <p>The Covid-19 prevention procedures for workers and community surrounding the project:</p> <ol style="list-style-type: none">1. Administrative Controls <p>Use administrative controls, when feasible, to reduce or eliminate the risk of exposure, such as training for construction workers on the spread of the disease in the geographic areas in which they work.</p> <ul style="list-style-type: none">▪ The signs and symptoms of Covid-19 and an explanation of how the disease is potentially spread, including the fact that infected people can spread the virus even if they do not have symptoms.▪ All policies and procedures that are applicable to the employee's duties as they relate to potential exposures to Covid-19. It is helpful to provide employees with a written copy of those standard operating procedures.▪ Information on appropriate social distancing and hygiene practices, including:<ul style="list-style-type: none">○ Avoiding physical contact with others and maintaining a distance of at least 6 feet (~ 2 m) from customers and other individuals, whenever possible, including inside work trailers.○ Appropriate cleaning practices (i.e., washing hands frequently with soap and water for at least 20 seconds, or, if soap and water are not immediately available, using alcohol-based hand sanitizer that contains at least 60% alcohol and rubbing hands until they are dry; sanitizing all surfaces workers will touch).○ The proper way to cover coughs and sneezes (i.e., sneezing or coughing into a tissue or into the upper sleeve).

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ Alternatives to shaking hands upon entry, and the importance of workers not touching their own faces (mouth, nose, eyes).○ The benefits of driving to work sites or parking areas individually, when possible, without passengers or carpools.▪ The types, proper use, limitations, location, handling, decontamination, removal, and disposal of any PPE being used.▪ The importance of staying home if they are sick.▪ Wearing masks over their noses and mouths to prevent them from spreading the virus.▪ The need to continue using other normal control measures, including PPE, necessary to protect workers from other job hazards associated with construction activities.▪ Using cleaning chemicals that have label claims against the coronavirus for cleaning frequently touched surfaces like tools, handles, and machines.▪ The need to report any safety and health concerns. <p>2. Safe Work Practices</p> <ul style="list-style-type: none">▪ To the extent possible, screen all visitors including community surrounding the project on all construction sites in advance of their arrival on the job site for signs and symptoms of Covid-19.▪ Adopt staggered work schedules, e.g., provide alternating workdays or extra shifts, to reduce the total number of employees on a job site at any given time and to ensure physical distancing.▪ Identify choke points where workers are forced to stand together, such as hallways, hoists and elevators, ingress and egress points, break areas, and buses, and implement policies to maintain social distancing.▪ Institute a rigorous housekeeping program to reduce dust levels on the job site.▪ Keep in-person meetings (including toolbox talks and safety meetings) as short as possible, limit the number of workers in attendance, and use social distancing practices.▪ Ensure clean toilet and handwashing facilities. Clean and disinfect portable job site toilets regularly. Fill hand sanitizer dispensers regularly. Disinfect frequently touched items (i.e., door pulls and toilet seats) regularly.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Source: Covid-19 Control and Prevention/ Construction Work, OSHA, United States Department of Labor.</p> <p>Watering on the road that is passed by dump trucks in a residential area periodically and limits the vehicle speed does not exceed 40 km / h when passing the area.</p> <p>Assign the flagman on roads which are often jammed by project vehicles</p> <p>Mitigation measures: Management System on Community Health and Safety should be applied and monitored during construction and operation.</p> <p>Wearing standard Personal Protection Equipment (PPE).</p>
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	✓		Argoguruh weir is not accessible to members of the affected community throughout project construction, operation and decommissioning. There is no rehabilitation work at Argoguruh weir and around the weir is fenced and padlocked. Based on the explanation in remarks above then it is should be no community safety risks due to both accidental and natural hazards.

REA Checklist

IRRIGATION

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: Indonesia/Project Preparation Consultant Way Sekampung Irrigation System

Sector :

Subsector:

Screening Questions		Score	Remarks ¹
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	1	Landslide
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	2	Topographical & geological condition
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	1	Heavy rain, floods
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): Medium risk

Other Comments: The Way Sekampung system has been established so long time with only minor risk to the performance of infrastructures,

The climate change will affect the productivity of paddy or other crops later in the far future

Prepared by: Kushartanto – Environment Specialist, Abidin Hadiarto - Irrigation Planning Design Specialist and Francois Kresno P - Assistant Hydraulic Modeling System.

¹ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

REA Checklist

IRRIGATION

Batanghari Utara Sub-system

Country/Project Title:

Indonesia/Project Preparation Consultant Way Sekampung
Irrigation System

Name of the respondents:

M. Johari, WUAF; Sukatmoko, Head of Public Relation; Hartato,
Public Relation staff; Bonari, Forestry Police; and Adi, Elephant
Charmer TNWK

Name of the visited area:

- o Village: Toto Projo, Raja Basa Lama
- o Sub- district: Way Bungur, Labuhan Ratu
- o District/City: East Lampung

Reminder:

- o The checklist is to be prepared to support the environmental classification of a project.
- o Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.
- o Carry a map of Protected Area.
- o Carry a camera.

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Protected Area		✓	<p>Location of the project area is not adjacent to or within any of the following protected area.</p> <ol style="list-style-type: none">1. Way Kambas National Park located in Lampung Timur District with a distance 3 km from project area.2. Gunung Balak Protected Forest located in Lampung Timur District with a distance 25 km from project area.3. Batu Serampok Protected Forest located in Lampung Selatan District with a distance 51 km from project area.
▪ Wetland		✓	Not within or adjacent to the Project area.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ Mangrove		√	Not within or adjacent to the Project area. The coastal (mangrove) area is located more than 40 km from the Project area.
▪ Estuarine		√	Not within or adjacent to the Project area. The coastal (estuarine) area is located more than 40 km from the Project area.
▪ Buffer zone of protected area		√	Not within or adjacent to the buffer zone of protected area.
▪ Special area for protecting biodiversity		√	Based on the discussion with <i>Dinas Lingkungan Hidup</i> /Environmental Agency, Lampung Province, there is Liwa Botanical Garden (<i>Kebun Raya Liwa/KRL</i>), however it is located in Lampung Barat District with a distance 120 km from the Project area.
B. Potential Environmental Impacts Will the Project cause...			
▪ loss of precious ecological values (e.g. result of encroachment into forests/swamplands or historical/cultural building/areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)?		√	<p>Works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.</p> <p>Batanghari Utara Sub-system area in the eastern part adjacent to Way Kambas National Park (TNWK).</p> <p>Way Sukadana River with a depth of 2 m ~ 6 m and a width of about 35 m ~ 40 m is situated between the nearby village of Batanghari Utara Sub-system and TNWK site. This big river as a natural barrier for the illegal hunting and logging.</p> <p>Illegal hunting still exists and sometimes it goes up and down, however for the arresting or enforcement of illegal hunting cases, it has decreased since 2017 with the following data: 9 cases in 2017, 3 cases in 2018, 2 cases in 2019 and 0 cases in 2020 (June 2020).</p> <p>TNWK is supported by 64 Forestry Policemen who conducting patrols with a team consists of 5 to 7 persons, including 3 men armed with rifles every week around the area by put up a tent. This national park also supported by 84 Elephant Charmers who the assistants and the partners in association with local community. They are also empowered as the Forestry Police Partner Community (MMP) as the informants when armed hunters entering into the nearby villages and when wild elephants encroaching into the nearby villages. Communication is done by creating a WAG.</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>The community is also empowered by holding the honey bee farms by TNWK management.</p> <p>Head of Public Relation expects after completion of Development of Way Sekampung Irrigation System, the community in Batanghari Utara Sub-system does not wish to encroach into TNWK, which paddy fields able to be planted with paddy and other crops throughout the year.</p> <p>No loss of precious ecological values e.g. result of encroachment into TNWK.</p>
▪ conflicts in water supply rights related social conflicts?	√		<p>During the dry season the distribution of irrigation water is disrupted, due to the reduced amount of water supply to the irrigation area. When two farmers need water at the same time, this can lead to conflict, because they both want very limited water.</p> <p>Farmers should coordination with the water master to regulate irrigation water flow as needed before use the water.</p>
▪ impediments to movements of people and animals?	√		<p>Project rehabilitation consist of sediment excavation, defect canal lining demolition and precast/concrete canal lining installation. Temporary stockpiling of sediment and debris on the edge of the canals which adjacent to the public roads (before transported by dump trucks to the disposal site) will obstruct the traffic of people and animals. Debris/demolition wastes are needed by the local people to filled up earth roads, yard and others.</p> <p>Installs safety line (barricade) around the storage area, traffic signs and lighting and assign the flagmen to arrange traffic are required.</p>
▪ potential ecological problems due to increased soil erosion and siltation, leading to decreased stream capacity?		√	<p>According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015 are classified into erosion level I (very light). The classification consists of I (very light), II (light), III (moderate), IV (heavy) and V (very heavy).</p> <p>No ecological value in leading to decreased stream capacity</p>
▪ Insufficient drainage leading to salinity intrusion?		√	Not applicable. Project area is located more than 40 km from coastal area.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ over pumping of groundwater, leading to salinization and ground subsidence?		√	Not applicable. This project is surface water irrigation.
▪ impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water?		√	<p>There is no rehabilitation/modernization activity in the river body. Activity is carried out in the canal, both primary and secondary canals.</p> <p>The sequence of work is as follows: a) stoppage temporarily of irrigation water before carrying out the work. before carrying out the work. The Cropping Season adjusts to the work schedule, b) implementation of work to the completion, c) clean up the used material/remnants of work from the irrigation canals and d) irrigation water flow is opened.</p>
▪ dislocation or involuntary resettlement of people?		√	The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not dislocate any person, therefore no involuntary resettlement of people.
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	<p>Lampung ethnic group consists of two indigenous groups, namely Lampung Saibatin and Lampung Pepadun. The area of Lampung Saibatin originally is located around the coast while the Pepadun is inland and hinterland, however that Indigenous People are not found surrounding the project area in Way Bungur Sub-district.</p> <p>No disproportionate impact on Indigenous Peoples or other vulnerable groups with considering that the works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.</p>
▪ potential social conflicts arising from land tenure and land use issues?		√	The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site, therefore no potential social conflicts arising from land tenure and land use issues.
▪ soil erosion before compaction and lining of canals?		√	<p>Soil erosion before compaction and lining of canals would be minimum.</p> <p>The sequence of work is as follows: a) stoppage temporarily of irrigation water before implementation of the work, b) demolition of existing canal lining and land clearing for earth secondary canals, c) compaction of canals, d) lining of canal is implemented after compaction of the canal is completed along 100 m,</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																		
▪ noise from construction equipment?	✓		<p>e) clean up the used material/remnants of work from the irrigation canals, and f) irrigation water flow is opened.</p> <p>Heavy equipment noise emission levels and the quantity are tabulated below:</p> <table border="1"> <thead> <tr> <th>Equipment</th><th>L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560</th><th>Unit</th></tr> </thead> <tbody> <tr> <td>Dump Truck</td><td>84</td><td>6</td></tr> <tr> <td>Excavator</td><td>85</td><td>3</td></tr> <tr> <td>Crane</td><td>85</td><td>14</td></tr> <tr> <td>Generator</td><td>82</td><td>3</td></tr> <tr> <td>Jackhammer*</td><td>85</td><td>20</td></tr> </tbody> </table> <p>* There are 82 dBA @ 7 meter rated jackhammers (90 lb. class) available. This would be equivalent to 74 dBA @ 50 ft. These are silenced with molded intricate muffler tools.</p> <p>Source:</p> <ul style="list-style-type: none"> ○ Federal Highway Administration, U.S. Department of Transportation. ○ Draft Feasibility Study Report, July 2020. <p>Workers with a full-shift average exposure above 85 dBA are required to wear hearing protection devices (either earplugs or earmuffs).</p> <p>This hearing damage can result from repeated exposure to levels above 85 dBA (such as years of working around construction noise without hearing protection).</p> <p>Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, concrete truck mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal) and noise from construction equipment and tools (e.g., dump truck, excavator, crane, jackhammer). Workers in the site are using tools such as: jackhammer, concrete mixer is the most people who are suffering from exposure to construction noise. Also, residents who are living beside the sites of construction works and those who are using the roads near to sites are suffering from the noise of construction.</p>	Equipment	L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560	Unit	Dump Truck	84	6	Excavator	85	3	Crane	85	14	Generator	82	3	Jackhammer*	85	20
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Dump Truck	84	6																			
Excavator	85	3																			
Crane	85	14																			
Generator	82	3																			
Jackhammer*	85	20																			

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Impacts of noise on human: exposure to prolonged or excessive noise has been shown to cause a range of health problems ranging from stress, poor concentration, productivity losses in the workplace, and communication difficulties and fatigue from lack of sleep, to more serious issues such as cardiovascular disease, cognitive impairment and tinnitus.</p> <p>The preferred way to prevent hearing damage is to reduce noise at its source. However, earplugs and earmuffs will always be necessary for some construction activities.</p> <p>Impacts of noise on wildlife: human-induced noise pollution is one of many factors contributing to the depletion of wildlife populations. Laboratory studies and limited field research have uncovered four major ways in which animals are adversely affected by noise pollution: hearing loss, resulting from noise levels of 85 dBA or greater; masking, which is the inability to hear important environmental cues and animal signals; non-auditory physiological effects, such as increased heart rate and respiration and general stress reaction; and behavioural effects, which vary greatly between species and noise characteristics, resulting in, for example, abandonment of territory and lost reproduction. Studies on Rhesus Monkeys in the laboratory have shown that a 30% increase in blood pressure following exposure to an average 85 dBA (lower at night, higher during the day) for eight months resulted in a permanently higher blood pressure and heart rate even after one month of quiet time! (Nature Sounds Society).</p> <p>Meanwhile, impacts of noise on plant: noise pollution is altering the landscape of plants and trees, which depend on noise-affected animals to pollinate them and spread their seeds. Some plants do worse in noisy areas, a study found, while others seem to do better, depending on how the community of creatures around them changes.</p> <p>Activity at night time will be more cause nuisance to the surrounding environment.</p> <p>Impact of noise on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (3 km to 51 km) from the existing</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			protected forest area, therefore, noise from construction activities does not cause negative impacts against animals and plants in the national park and protected forest areas.
▪ dust during construction?	✓		<p>Dust because of vehicles: vehicles entrance and exist to the site is very important task, which generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site, this means that not only the labours will harm, but also the public.</p> <p>Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal/excavation.</p> <p>There are some people exposing and breathing dust every day regardless they are labours, residents, or those who are using roads near to construction sites.</p> <p>Dust pollution is the introduction of particulate matter that cause harm or discomfort to humans or other living organisms, or cause damage to the natural environment.</p> <p>Impacts of dust on human: in fact, dust when inhaled can increase breathing problems, damage lung tissue, and aggravate existing health problems. In addition to health concerns, dust generated from various activities can reduce visibility, resulting in accidents (Division of Genetics and Plant Propagation, India) and impacts of dust on plant: the rate of photosynthesis will decrease if the stomata on the surface of leaves be covered with dust. Therefore, if stomatal pores will be covered, then there will be decline in the process of photosynthesis and ultimately the plant will die due to absence of nutrients.</p> <p>Meanwhile, impacts of dust on animals: according to the American Society for the Prevention of Cruelty to Animals (ASPCA), when allergy season hits, dust may</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>affect the health of the pets with suffer the nagging symptom, such as a runny nose, itchy eyes and dry skin.</p> <p>Impact of dust on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (3 km to 51 km) from the existing protected forest area, therefore, dust from construction activities does not cause negative impacts against animals and plants in the national park and protected forest areas.</p> <p>The mitigation measures to minimize the impact, such as (i) regular watering to exposed lands by water tank which the water is taken from the nearest river; (ii) cover the tailgate with tarpaulin or plastic sheet during transporting dispersible materials to and from the site to prevent debris scattered and dust spreads to area surrounding transportation corridor traverses; (iii) the dust content due to demolition of canal lining is minimized by watering the site through water tank which the water is taken from the nearest river ; (iv) and agreement with the local community on the schedule and duration of construction works, (iv) construction workers should wear standard PPE (dust masker).</p>
▪ waterlogging and soil salinization due to inadequate drainage and farm management?	√		<p>Extraction of materials can disrupt natural land contours and vegetation, resulting in accelerated erosion, disturbance in natural drainage patterns and waterlogging.</p> <p>So far, waterlogging in irrigation area due to reduced drainage capacity has never occurred, because excavation of sediment in the canal is always done periodically. Sediment removal plan annually by machinery in main canal is 2,240 m³, meanwhile sediment removal by man power 1 m depth in secondary canal is 168 m³ (Draft Feasibility Study Report, July 2020).</p>
▪ leaching of soil nutrients and changes in soil characteristics due to excessive application of irrigation water?	√		Farmers saving irrigation water, do not inundate land when planting paddy (transplanting), there is no swift flow of water that transport soil nutrient out of paddy fields.
▪ reduction of downstream water supply during peak seasons?	√		Reduction of downstream water supply occurred during dry seasons, which the required discharge is insufficient to irrigate the entire irrigation area, so that most of the discharge is flowed into the irrigation area. In this

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																													
			<p>condition, water supply to downstream of the Argoguruh weir is limited.</p> <p>However, the case did not continue until the conflict.</p>																													
<ul style="list-style-type: none"> ▪ soil pollution, polluted farm runoff and groundwater, and public health risks due to excessive application of fertilizers and pesticides? 	√		<p>No excessive application of fertilizers and pesticides. Integrated Crop Management (ICM) and Integrated Pest Management (IPM) have been applied by most farmers to use fertilizer according to the need and promote on using organic fertilizer.</p> <p>Application of ICM and IPM in the field will follow the instruction of PPL (<i>Penyuluhan Pertanian Lapangan</i>/ Field Extension Worker). PPL conducts an extension to the farmers every 2 to 3 weeks.</p> <p>Water quality of Way Sekampung River in downstream area in some locations related to application of fertilizers in Way Sekampung Irrigation System, as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Parameter</th> <th>Apr 2009</th> <th>May 2009</th> <th>Jun 2009</th> <th>Water Quality Standard Class IV</th> </tr> <tr> <th colspan="4">mg/L</th> </tr> </thead> <tbody> <tr> <td>Nitrate Nitrogen (NO₃ - N)</td> <td>1.5678</td> <td>0.9716</td> <td>0.6629</td> <td><20</td> </tr> <tr> <td>Nitrite Nitrogen (NO₂ - N)</td> <td>0.1662</td> <td>0.1682</td> <td>0.0131</td> <td>-</td> </tr> <tr> <td>Ammonia (NH₃ - N)</td> <td>0.8113</td> <td>0.5818</td> <td>0.5239</td> <td>-</td> </tr> <tr> <td>Phosphate</td> <td>0.1161</td> <td>0.1467</td> <td>0.2188</td> <td>5</td> </tr> </tbody> </table> <p>Source: BPLHD, Regional Environmental Status Data Book, Lampung Province, 2009</p> <p>Measurement in Gunung Raya Village, Sekampung Udk Sub district, East Lampung District.</p>	Parameter	Apr 2009	May 2009	Jun 2009	Water Quality Standard Class IV	mg/L				Nitrate Nitrogen (NO ₃ - N)	1.5678	0.9716	0.6629	<20	Nitrite Nitrogen (NO ₂ - N)	0.1662	0.1682	0.0131	-	Ammonia (NH ₃ - N)	0.8113	0.5818	0.5239	-	Phosphate	0.1161	0.1467	0.2188	5
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REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks				
			Parameter	Apr 2009	May 2009	Jun 2009	Water Quality Standard Class IV
			mg/L				
			Nitrate Nitrogen (NO ₃ - N)	1.115	1.2169	0.4887	<20
			Nitrite Nitrogen (NO ₂ - N)	0.1319	0.1319	0.0124	-
			Ammonia (NH ₃ - N)	0.6432	0.2756	0.3206	-
▪ soil erosion (furrow, surface)?	✓		Source: BPLHD, Regional Environmental Status Data Book, Lampung Province, 2009				
▪ scouring canals?	✓		Measurement in Margo Toto Village, Metro Kibang Sub-District, South Lampung District.				
▪ clogging of canals by sediments?	✓		According to the contents of Nitrate Nitrogen, Nitrite Nitrogen, Ammonia and Phosphate showed still far below the standard.				
▪ clogging of canals by weeds?	✓		According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015, the Project area is classified into erosion level I (very light). The classification: I (very light), II (light), III (moderate), IV (heavy) and V (very heavy).				
▪ scouring canals?	✓		No scouring canals. Canal slope with concrete lining along the feeder canals and primary canals, meanwhile canals slope and canal bed with concrete lining along the secondary canals. The canal gradient 0.0003 and flow velocity 0.5 m/sec to 1.4 m/sec appropriate with the design standards (Feasibility Study Report, July 2020).				
▪ clogging of canals by sediments?	✓		Sedimentation occurs at the ends of primary and secondary canals, because water flow slows down and even stops when the water gates are clogged by sediment / rubbish.				
▪ clogging of canals by weeds?	✓		Coordination with the water master (Ili-ili) or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.				
▪ scouring canals?	✓		Sedimentation occurs at the ends of primary and secondary canals, because water flow slows down and even stops when the water gates are clogged by weed (water hyacinth).				

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			Coordination with the water master or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.
▪ seawater intrusion into downstream freshwater systems?	✓		Not applicable. Irrigation area not located in coastal area.
▪ introduction of increase in incidence of waterborne or water related diseases?		✓	<p>Information collected from Public Health Centre related is a matter of household sanitation, clean water sources, Public Health Centre programs, and free defecation programs conducted with village offices and the top 10 diseases in one year based on the number of patient visits. Water-borne diseases that enter the top ten are dominated by diarrhoea and dermatitis. At the top, it is dominated by airborne diseases such as upper respiratory tract infection. However, non-infectious diseases have started to move up in the top ten.</p> <p>A pre-formulated questionnaire was used to interview respondents containing questions about personal data, characteristics of farmers, duration of contact with irrigation water, use of pesticides and fertilizers, use of personal protective equipment, availability of clean water and household sanitation. The survey was conducted in a sample of 31 villages and 210 farmer interviews which form the sample for assessing community health in the Way Sekampung Irrigation System.</p> <p>Waterborne diseases occur due to poor hygiene, household sanitation and bad quality of clean water sources. These diseases can be transmitted by waterborne, such as diarrhoea, dysentery, cholera, polio, typhoid, hepatitis, meningitis. Interviewing farmers indicated low levels of waterborne diseases within the Way Sekampung Irrigation System. It is noted that one farmer was infected with dengue fever, one person suffered diarrhoea, and one person had typhoid and 8 person's dermatitis. In total, this amounts to only 5% of the sample. Other infectious diseases that occur anecdotal are cough, flu, and fever. The amount is 2% of the sample. Non-infectious diseases reported are rheumatic pain, headache, and gastritis, for 6% of the sample. Non-infectious diseases have been shifting to the top ten diseases in Way Sekampung Irrigation System.</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> ▪ dangers to a safe and healthy working environment due to physical, chemical and biological hazards during project construction and operation? 	✓		<p>(Feasibility Study Report, Development of Way Sekampung Irrigation System, Supplement I Public Health Report, July 2020).</p> <p>No chemical and biological materials used during project construction and operation.</p> <p>Dangers to a safe and healthy working environment due to hazards during project construction, such as:</p> <ul style="list-style-type: none"> - Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the workers. - Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site will harm the labours. - Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal. - There are some people exposing and breathing dust every day regardless they are labours of construction work. - Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction tools (e.g., jackhammer). Workers in the site are using equipment and tools such as: dump truck, excavator, crane, jackhammer and concrete mixer are the most people who are suffering from exposure to construction noise. - Workers in the site are using jackhammer are suffering from exposure to construction vibration. - Installation of precast canal lining in primary canal by the crane. The movement of workers in the canal (right and left sides) by passing the ladder placed on the slope of the canal. Average height of primary canals is 6.0 m. Placement of the ladder on unstable

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			<p>site may cause the ladder to collapse and worker to fall.</p> <ul style="list-style-type: none"> - Meanwhile, the installation of concrete canal lining in the secondary canal by a Concrete Truck Mixer. Movement of workers in the canal (right and left sides) by crossing temporary pedestrian bridge placed on both sides of the canal. Average height of secondary canals is 2.5 m. Placement of the bridge at a fragile location, not strong bridge material and the absence of a hand rail may cause to collapse of the bridge and the fall of passing workers. - Workers should wear standard PPE (helmet, gloves /vibration-damping gloves, safety boots, ear protection and face protection). <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area.</p> <p>Some locations will be occupied for Base camp, warehouse, fuel tank and heavy equipment parking for project rehabilitation.</p> <p>Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response plan and evacuation route should be provided.</p>
▪ social conflicts if workers from other regions or countries are hired?	✓		<p>Total workforce during project rehabilitation is 370 persons, which around 75% of the total workforce as unskilled labourers employed from surrounding residents and they will live in their respective homes, therefore there are not any a large population influx. Recruits local labour profusely.</p> <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area. This condition not likely to causes increased burden on social infrastructure and services (such as water supply and sanitation systems).</p>
	✓		<p>Many unskilled workers, bricklayer, drivers and securities are available for project construction in surrounding project area.</p> <p>Priority for local workers.</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	✓		<p>There is no transport, storage, and use and/or disposal of materials such as explosives and other chemicals during construction and operation.</p> <p>Risks to community health and safety due to the transport, storage, and use and/or disposal of materials during construction, such as:</p> <ul style="list-style-type: none"> - Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dusts out the site will harm the public. - Dust because of construction activities: the majority of construction activities causes an effect on the environment, due to generates amount of dust. Project location is adjacent to residential area. These activities such as canal lining demolition and sediment removal/excavation. - There are some people exposing and breathing dust every day regardless they are residents, or those who are using roads near to construction sites. - Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction equipment and tools (e.g., dump truck, excavator, crane, jackhammer). Residents who are living beside the sites of construction works and those who are using the roads near to sites are suffering from the noise of construction. - Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the residents, which staying in the transportation corridor traverses by construction vehicles. - No hazardous waste. No painting work. Painting irrigation gates and other structures is undertaken by fabrication. - Handling oil spills from vehicle, etc. with the following steps:

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ Sprinkle sawdust or coconut husks,○ Allow the absorbent material to work on the oil for 24 to 48 hours,○ Repeat with fresh absorbent material as needed to remove any remaining oil.- Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response and evacuation route should be provided. <p>The Covid-19 prevention procedures for workers and community surrounding the project:</p> <ol style="list-style-type: none">1. Administrative Controls <p>Use administrative controls, when feasible, to reduce or eliminate the risk of exposure, such as training for construction workers on the spread of the disease in the geographic areas in which they work.</p> <ul style="list-style-type: none">▪ The signs and symptoms of Covid-19 and an explanation of how the disease is potentially spread, including the fact that infected people can spread the virus even if they do not have symptoms.▪ All policies and procedures that are applicable to the employee's duties as they relate to potential exposures to Covid-19. It is helpful to provide employees with a written copy of those standard operating procedures.▪ Information on appropriate social distancing and hygiene practices, including:<ul style="list-style-type: none">○ Avoiding physical contact with others and maintaining a distance of at least 6 feet (~ 2 m) from customers and other individuals, whenever possible, including inside work trailers.○ Appropriate cleaning practices (i.e., washing hands frequently with soap and water for at least 20 seconds, or, if soap and water are not immediately available, using alcohol-based hand sanitizer that contains at least 60% alcohol and rubbing hands until they are dry; sanitizing all surfaces workers will touch).○ The proper way to cover coughs and sneezes (i.e., sneezing or coughing into a tissue or into the upper sleeve).

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ Alternatives to shaking hands upon entry, and the importance of workers not touching their own faces (mouth, nose, eyes).○ The benefits of driving to work sites or parking areas individually, when possible, without passengers or carpools.▪ The types, proper use, limitations, location, handling, decontamination, removal, and disposal of any PPE being used.▪ The importance of staying home if they are sick.▪ Wearing masks over their noses and mouths to prevent them from spreading the virus.▪ The need to continue using other normal control measures, including PPE, necessary to protect workers from other job hazards associated with construction activities.▪ Using cleaning chemicals that have label claims against the coronavirus for cleaning frequently touched surfaces like tools, handles, and machines.▪ The need to report any safety and health concerns. <p>2. Safe Work Practices</p> <ul style="list-style-type: none">▪ To the extent possible, screen all visitors including community surrounding the project on all construction sites in advance of their arrival on the job site for signs and symptoms of Covid-19.▪ Adopt staggered work schedules, e.g., provide alternating workdays or extra shifts, to reduce the total number of employees on a job site at any given time and to ensure physical distancing.▪ Identify choke points where workers are forced to stand together, such as hallways, hoists and elevators, ingress and egress points, break areas, and buses, and implement policies to maintain social distancing.▪ Institute a rigorous housekeeping program to reduce dust levels on the job site.▪ Keep in-person meetings (including toolbox talks and safety meetings) as short as possible, limit the number of workers in attendance, and use social distancing practices.▪ Ensure clean toilet and handwashing facilities. Clean and disinfect portable job site toilets regularly. Fill hand sanitizer dispensers regularly. Disinfect frequently touched items (i.e., door pulls and toilet seats) regularly.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Source: Covid-19 Control and Prevention/ Construction Work, OSHA, United States Department of Labor.</p> <p>Watering on the road that is passed by dump trucks in a residential area periodically and limits the vehicle speed does not exceed 40 km / h when passing the area.</p> <p>Assign the flagman on roads which are often jammed by project vehicles</p> <p>Mitigation measures: Management System on Community Health and Safety should be applied and monitored during construction and operation.</p> <p>Wearing standard Personal Protection Equipment (PPE).</p>
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	✓		Argoguruh weir is not accessible to members of the affected community throughout project construction, operation and decommissioning. There is no rehabilitation work at Argoguruh weir and around the weir is fenced and padlocked. Based on the explanation in remarks above then it is should be no community safety risks due to both accidental and natural hazards.

REA Checklist

IRRIGATION

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: Indonesia/Project Preparation Consultant Way Sekampung Irrigation System

Sector :

Subsector:

Screening Questions		Score	Remarks ¹
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	1	Landslide
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	2	Topographical & geological condition
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	1	Heavy rain, floods
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): Medium risk

Other Comments: The Way Sekampung system has been established so long time with only minor risk to the performance of infrastructures,

The climate change will affect the productivity of paddy or other crops later in the far future

Prepared by: Kushartanto – Environment Specialist, Abidin Hadiarto - Irrigation Planning Design Specialist and Francois Kresno P - Assistant Hydraulic Modeling System.

¹ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

REA Checklist

IRRIGATION

Bekri Sub-system

Country/Project Title: Indonesia/Project Preparation Consultant Way Sekampung Irrigation System

Name of the respondents: Parlan, WUA

Name of the visited area:

- Village: Tulung Kakan
- Sub- district: Bumi Ratu Nuban
- District/City: Central Lampung

Reminder:

- o The checklist is to be prepared to support the environmental classification of a project.
- o Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.
- o Carry a map of Protected Area.
- o Carry a camera.

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Protected Area		✓	<p>Location of the project area is not adjacent to or within any of the following protected area.</p> <ol style="list-style-type: none">1. Way Waya Gunung Tanggamus Protected Forest located in Lampung Tengah and Tanggamus Districts with a distance 38 km from project area.2. Perentian Batu Protected Forest located in Pesawaran District with a distance 52 km from project area.3. Wan Abdul Rachman Grand Forest Park located in Pesawaran District with a distance 33 km from project area.4. Batu Serampok Protected Forest located in Lampung Selatan District with a distance 39 km from project area.
▪ Wetland		✓	Not within or adjacent to the Project area.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ Mangrove		✓	Not within or adjacent to the Project area. The coastal (mangrove) area is located more than 32 km from the Project area.
▪ Estuarine		✓	Not within or adjacent to the Project area. The coastal (estuarine) area is located more than 32 km from the Project area.
▪ Buffer zone of protected area		✓	Not within or adjacent to the buffer zone of protected area.
▪ Special area for protecting biodiversity		✓	Based on the discussion with <i>Dinas Lingkungan Hidup</i> /Environmental Agency, Lampung Province, there is Liwa Botanical Garden (<i>Kebun Raya Liwa/KRL</i>), however it is located in Lampung Barat District with a distance 120 km from the Project area.
B. Potential Environmental Impacts Will the Project cause...			
▪ loss of precious ecological values (e.g. result of encroachment into forests/swamplands or historical/cultural buildings/areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)?		✓	Works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.
▪ conflicts in water supply rights related social conflicts?	✓		During the dry season the distribution of irrigation water is disrupted, due to the reduced amount of water supply to the irrigation area. When two farmers need water at the same time, this can lead to conflict, because they both want very limited water. Farmers should coordination with the water master (Illi-ili) to regulate irrigation water flow as needed before use the water.
▪ impediments to movements of people and animals?	✓		Project rehabilitation consist of sediment excavation, defect canal lining demolition and precast/concrete canal lining installation. Temporary stockpiling of sediment and debris on the edge of the canals which adjacent to the public roads (before transported by dump trucks to the disposal site) will obstruct the traffic of people and animals. Debris/demolition wastes are needed by the local people to filled up earth roads, yard and others. Installs safety line (barricade) around the storage area, traffic signs and lighting and assign the flagmen to arrange traffic are required.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ potential ecological problems due to increased soil erosion and siltation, leading to decreased stream capacity?		✓	<p>According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015 are classified into erosion level I (very light). The classification consists of I (very light), II (light), III (moderate), IV (heavy) and V (very heavy).</p> <p>No ecological value in leading to decreased stream capacity.</p>
▪ Insufficient drainage leading to salinity intrusion?		✓	Not applicable. Project area is located more than 40 km from coastal area.
▪ over pumping of groundwater, leading to salinization and ground subsidence?		✓	Not applicable. This project is surface water irrigation.
▪ impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water?		✓	<p>There is no rehabilitation/modernization activity in the river body. Activity is carried out in the canal, both primary and secondary canals.</p> <p>The sequence of work is as follows: a) stoppage temporarily of irrigation water before carrying out the work. before carrying out the work. The Cropping Season adjusts to the work schedule, b) implementation of work to the completion, c) clean up the used material/remnants of work from the irrigation canals and d) irrigation water flow is opened.</p>
▪ dislocation or involuntary resettlement of people?		✓	The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not dislocate any person, therefore no involuntary resettlement of people.
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	<p>Lampung ethnic group consists of two indigenous groups, namely Lampung Saibatin and Lampung Pepadun. The area of Lampung Saibatin originally is located around the coast while the Pepadun is inland and hinterland, however that Indigenous People are not found surrounding the project area in Bumi Ratu Nuban Sub-district.</p> <p>No disproportionate impact on Indigenous Peoples or other vulnerable groups with considering that the works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.</p>
▪ potential social conflicts arising from land tenure and land use issues?		✓	The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site, therefore no potential

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																		
			<p>social conflicts arising from land tenure and land use issues.</p>																		
▪ soil erosion before compaction and lining of canals?		✓	<p>Soil erosion before compaction and lining of canals would be minimum.</p> <p>The sequence of work is as follows: a) stoppage temporarily of irrigation water before implementation of the work, b) demolition of existing canal lining and land clearing for earth secondary canals, c) compaction of canals, d) lining of canal is implemented after compaction of the canal is completed along 100 m, e) clean up the used material/remnants of work from the irrigation canals, and f) irrigation water flow is opened.</p>																		
▪ noise from construction equipment?	✓		<p>Heavy equipment noise emission levels and the quantity are tabulated below:</p> <table border="1"> <thead> <tr> <th>Equipment</th> <th>L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>Dump Truck</td> <td>84</td> <td>2</td> </tr> <tr> <td>Excavator</td> <td>85</td> <td>1</td> </tr> <tr> <td>Crane</td> <td>85</td> <td>8</td> </tr> <tr> <td>Generator</td> <td>82</td> <td>1</td> </tr> <tr> <td>Jackhammer*</td> <td>85</td> <td>6</td> </tr> </tbody> </table> <p>* There are 82 dBA @ 7 meter rated jackhammers (90 lb. class) available. This would be equivalent to 74 dBA @ 50 ft. These are silenced with molded intricate muffler tools.</p> <p>Source:</p> <ul style="list-style-type: none"> ○ Federal Highway Administration, U.S. Department of Transportation. ○ Draft Feasibility Study Report, July 2020. <p>Workers with a full-shift average exposure above 85 dBA are required to wear hearing protection devices (either earplugs or earmuffs).</p> <p>This hearing damage can result from repeated exposure to levels above 85 dBA (such as years of working around construction noise without hearing protection).</p>	Equipment	L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560	Unit	Dump Truck	84	2	Excavator	85	1	Crane	85	8	Generator	82	1	Jackhammer*	85	6
Equipment	L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560	Unit																			
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Generator	82	1																			
Jackhammer*	85	6																			

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, concrete truck mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal) and noise from construction equipment and tools (e.g., dump truck, excavator, crane, jackhammer). Workers in the site are using tools such as: jackhammer, concrete mixer is the most people who are suffering from exposure to construction noise. Also, residents who are living beside the sites of construction works and those who are using the roads near to sites are suffering from the noise of construction.</p> <p>Impacts of noise on human: exposure to prolonged or excessive noise has been shown to cause a range of health problems ranging from stress, poor concentration, productivity losses in the workplace, and communication difficulties and fatigue from lack of sleep, to more serious issues such as cardiovascular disease, cognitive impairment and tinnitus.</p> <p>The preferred way to prevent hearing damage is to reduce noise at its source. However, earplugs and earmuffs will always be necessary for some construction activities.</p> <p>Impacts of noise on wildlife: human-induced noise pollution is one of many factors contributing to the depletion of wildlife populations. Laboratory studies and limited field research have uncovered four major ways in which animals are adversely affected by noise pollution: hearing loss, resulting from noise levels of 85 dBA or greater; masking, which is the inability to hear important environmental cues and animal signals; non-auditory physiological effects, such as increased heart rate and respiration and general stress reaction; and behavioural effects, which vary greatly between species and noise characteristics, resulting in, for example, abandonment of territory and lost reproduction. Studies on Rhesus Monkeys in the laboratory have shown that a 30% increase in blood pressure following exposure to an average 85 dBA (lower at night, higher during the day) for eight months resulted in a permanently higher blood pressure and heart rate even after one month of quiet time! (Nature Sounds Society).</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Meanwhile, impacts of noise on plant: noise pollution is altering the landscape of plants and trees, which depend on noise-affected animals to pollinate them and spread their seeds. Some plants do worse in noisy areas, a study found, while others seem to do better, depending on how the community of creatures around them changes.</p> <p>Activity at night time will be more cause nuisance to the surrounding environment.</p> <p>Impact of noise on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (33 km to 52 km) from the existing protected forest area, therefore, noise from construction activities does not cause negative impacts against animals and plants in the grand forest park and protected forest areas.</p>
▪ dust during construction?	✓		<p>Dust because of vehicles: vehicles entrance and exist to the site is very important task, which generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site, this means that not only the labours will harm, but also the public.</p> <p>Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal/excavation.</p> <p>There are some people exposing and breathing dust every day regardless they are labours, residents, or those who are using roads near to construction sites.</p> <p>Dust pollution is the introduction of particulate matter that cause harm or discomfort to humans or other living organisms, or cause damage to the natural environment.</p> <p>Impacts of dust on human: in fact, dust when inhaled can increase breathing problems, damage lung tissue, and aggravate existing health problems. In addition to health concerns, dust generated from various activities</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>can reduce visibility, resulting in accidents (Division of Genetics and Plant Propagation, India) and impacts of dust on plant: the rate of photosynthesis will decrease if the stomata on the surface of leaves be covered with dust. Therefore, if stomatal pores will be covered, then there will be decline in the process of photosynthesis and ultimately the plant will die due to absence of nutrients.</p> <p>Meanwhile, impacts of dust on animals: according to the American Society for the Prevention of Cruelty to Animals (ASPCA), when allergy season hits, dust may affect the health of the pets with suffer the nagging symptom, such as a runny nose, itchy eyes and dry skin.</p> <p>Impact of dust on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (33 km to 52 km) from the existing protected forest area, therefore, dust from construction activities does not cause negative impacts against animals and plants in the grand forest park and protected forest areas.</p> <p>The mitigation measures to minimize the impact, such as (i) regular watering to exposed lands by water tank which the water is taken from the nearest river; (ii) cover the tailgate with tarpaulin or plastic sheet during transporting dispersible materials to and from the site to prevent debris scattered and dust spreads to area surrounding transportation corridor traverses; (iii) the dust content due to demolition of canal lining is minimized by watering the site through water tank which the water is taken from the nearest river ; (iv) and agreement with the local community on the schedule and duration of construction works, (iv) construction workers should wear standard PPE (dust masker).</p>
▪ waterlogging and soil salinization due to inadequate drainage and farm management?		✓	<p>Extraction of materials can disrupt natural land contours and vegetation, resulting in accelerated erosion, disturbance in natural drainage patterns and waterlogging.</p> <p>So far, waterlogging in irrigation area due to reduced drainage capacity has never occurred, because excavation of sediment in the canal is always done periodically. Sediment removal plan annually by machinery in main canal is 1,120 m³, meanwhile</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																														
			sediment removal by man power 1 m depth in secondary canal is 558 m ³ (Feasibility Study Report, July 2020).																														
▪ leaching of soil nutrients and changes in soil characteristics due to excessive application of irrigation water?	✓		Farmers saving irrigation water, do not inundate land when planting paddy (transplanting), there is no swift flow of water that transport soil nutrient out of paddy fields.																														
▪ reduction of downstream water supply during peak seasons?	✓		Reduction of downstream water supply occurred during dry seasons, which the required discharge is insufficient to irrigate the entire irrigation area, so that most of the discharge is flowed into the irrigation area. In this condition, water supply to downstream of the Argoguruh weir is limited. However, the case did not continue until the conflict.																														
▪ soil pollution, polluted farm runoff and groundwater, and public health risks due to excessive application of fertilizers and pesticides?	✓		No excessive application of fertilizers and pesticides. Integrated Crop Management (ICM) and Integrated Pest Management (IPM) have been applied by most farmers to use fertilizer according to the need and promote on using organic fertilizer. Application of ICM and IPM in the field will follow the instruction of PPL (<i>Penyuluhan Pertanian Lapangan</i> / Field Extension Worker). PPL conducts an extension to the farmers every 2 to 3 weeks. Water quality of Way Sekampung River in downstream area in some locations related to application of fertilizers in Way Sekampung Irrigation System, as follows:																														
<table border="1"> <thead> <tr> <th>Parameter</th> <th>Apr 2009</th> <th>May 2009</th> <th>Jun 2009</th> <th>Water Quality Standard Class IV</th> </tr> </thead> <tbody> <tr> <td colspan="4" style="text-align: center;">mg/L</td><td></td></tr> <tr> <td>Nitrate Nitrogen (NO₃ - N)</td><td>1.5678</td><td>0.9716</td><td>0.6629</td><td><20</td></tr> <tr> <td>Nitrite Nitrogen (NO₂ - N)</td><td>0.1662</td><td>0.1682</td><td>0.0131</td><td>-</td></tr> <tr> <td>Ammonia (NH₃ - N)</td><td>0.8113</td><td>0.5818</td><td>0.5239</td><td>-</td></tr> <tr> <td>Phosphate</td><td>0.1161</td><td>0.1467</td><td>0.2188</td><td>5</td></tr> </tbody> </table>				Parameter	Apr 2009	May 2009	Jun 2009	Water Quality Standard Class IV	mg/L					Nitrate Nitrogen (NO ₃ - N)	1.5678	0.9716	0.6629	<20	Nitrite Nitrogen (NO ₂ - N)	0.1662	0.1682	0.0131	-	Ammonia (NH ₃ - N)	0.8113	0.5818	0.5239	-	Phosphate	0.1161	0.1467	0.2188	5
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REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks				
			Parameter	Apr 2009	May 2009	Jun 2009	Water Quality Standard Class IV
			Measurement in Gunung Raya Village, Sekampung Udik Sub district, East Lampung District.				
			Nitrate Nitrogen (NO ₃ - N)	1.115	1.2169	0.4887	<20
			Nitrite Nitrogen (NO ₂ - N)	0.1319	0.1319	0.0124	-
			Ammonia (NH ₃ - N)	0.6432	0.2756	0.3206	-
			Phosphate	0.0974	0.1244	0.1999	5
			Source: BPLHD, Regional Environmental Status Data Book, Lampung Province, 2009				
			Measurement in Margo Toto Village, Metro Kibang Sub-District, South Lampung District.				
			According to the contents of Nitrate Nitrogen, Nitrite Nitrogen, Ammonia and Phosphate showed still far below the standard.				
▪ soil erosion (furrow, surface)?		✓	According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015, the Project area is classified into erosion level I (very light). The classification: I (very light), II (light), III (moderate), IV (heavy) and V (very heavy).				
▪ scouring canals?		✓	No scouring canals. Canal slope with concrete lining along the feeder canals and primary canals, meanwhile canals slope and canal bed with concrete lining along the secondary canals. The canal gradient 0.0003 and flow velocity 0.5 m/sec to 1.4 m/sec appropriate with the design standards (Feasibility Study Report, July 2020).				
▪ clogging of canals by sediments?	✓		Sedimentation occurs at the ends of primary and secondary canals, because water flow slows down and even stops when the water gates are clogged by sediment / rubbish. Coordination with the water master (Ili-ili) or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.				

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ clogging of canals by weeds?	✓		<p>Sedimentation occurs at the ends of primary and secondary canals, because water flow slows down and even stops when the water gates are clogged by weed (water hyacinth).</p> <p>Coordination with the water master (Ili-ili) or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.</p>
▪ seawater intrusion into downstream freshwater systems?		✓	<p>Not applicable. Irrigation area not located in coastal area.</p>
▪ introduction of increase in incidence of waterborne or water related diseases?		✓	<p>Information collected from Public Health Centre related is a matter of household sanitation, clean water sources, Public Health Centre programs, and free defecation programs conducted with village offices and the top 10 diseases in one year based on the number of patient visits. Water-borne diseases that enter the top ten are dominated by diarrhoea and dermatitis. At the top, it is dominated by airborne diseases such as upper respiratory tract infection. However, non-infectious diseases have started to move up in the top ten.</p> <p>A pre-formulated questionnaire was used to interview respondents containing questions about personal data, characteristics of farmers, duration of contact with irrigation water, use of pesticides and fertilizers, use of personal protective equipment, availability of clean water and household sanitation. The survey was conducted in a sample of 31 villages and 210 farmer interviews which form the sample for assessing community health in the Way Sekampung Irrigation System.</p> <p>Waterborne diseases occur due to poor hygiene, household sanitation and bad quality of clean water sources. These diseases can be transmitted by waterborne, such as diarrhoea, dysentery, cholera, polio, typhoid, hepatitis, meningitis. Interviewing farmers indicated low levels of waterborne diseases within the Way Sekampung Irrigation System. It is noted that one farmer was infected with dengue fever, one person suffered diarrhoea, and one person had typhoid and 8 person's dermatitis. In total, this amounts to only 5% of the sample. Other infectious diseases that occur anecdotal are cough, flu, and fever. The amount is 2% of the sample. Non-infectious diseases reported are rheumatic pain, headache, and gastritis, for 6% of the sample. Non-infectious diseases have been shifting to</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>the top ten diseases in Way Sekampung Irrigation System (Feasibility Study Report, Development of Way Sekampung Irrigation System, Supplement I Public Health Report, July 2020).</p>
▪ dangers to a safe and healthy working environment due to physical, chemical and biological hazards during project construction and operation?	✓		<p>No chemical and biological materials used during project construction and operation.</p> <p>Dangers to a safe and healthy working environment due to hazards during project construction, such as:</p> <ul style="list-style-type: none"> - Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the workers. - Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site will harm the labours. - Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal. - There are some people exposing and breathing dust every day regardless they are labours of construction work. - Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction tools (e.g., jackhammer). Workers in the site are using equipment and tools such as: dump truck, excavator, crane, jackhammer and concrete mixer are the most people who are suffering from exposure to construction noise. - Workers in the site are using jackhammer are suffering from exposure to construction vibration. - Installation of precast canal lining in primary canal by the crane. The movement of workers in the canal (right and left sides) by passing the ladder placed on the slope of the canal. Average height of primary

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>canals is 6.0 m. Placement of the ladder on unstable site may cause the ladder to collapse and worker to fall.</p> <ul style="list-style-type: none"> - Meanwhile, the installation of concrete canal lining in the secondary canal by a Concrete Truck Mixer. Movement of workers in the canal (right and left sides) by crossing temporary pedestrian bridge placed on both sides of the canal. Average height of secondary canals is 2.5 m. Placement of the bridge at a fragile location, not strong bridge material and the absence of a hand rail may cause to collapse of the bridge and the fall of passing workers. - Workers should wear standard PPE (helmet, gloves /vibration-damping gloves, safety boots, ear protection and face protection). <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area.</p> <p>Some locations will be occupied for Base camp, warehouse, fuel tank and heavy equipment parking for project rehabilitation.</p> <p>Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response plan and evacuation route should be provided.</p>
<ul style="list-style-type: none"> ▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)? 	✓		<p>Total workforce during project rehabilitation is 148 persons, which around 75% of the total workforce as unskilled labourers employed from surrounding residents and they will live in their respective homes, therefore there are not any a large population influx. Recruits local labour profusely.</p> <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area. This condition not likely to causes increased burden on social infrastructure and services (such as water supply and sanitation systems).</p>
<ul style="list-style-type: none"> ▪ social conflicts if workers from other regions or countries are hired? 	✓		<p>Many unskilled workers, bricklayer, drivers and securities are available for project construction in surrounding project area.</p> <p>Priority for local workers.</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	✓		<p>There is no transport, storage, and use and/or disposal of materials such as explosives and other chemicals during construction and operation.</p> <p>Risks to community health and safety due to the transport, storage, and use and/or disposal of materials during construction, such as:</p> <ul style="list-style-type: none"> - Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site will harm the public. - Dust because of construction activities: the majority of construction activities causes an effect on the environment, due to generates amount of dust. Project location is adjacent to residential area. These activities such as canal lining demolition and sediment removal/excavation. - There are some people exposing and breathing dust every day regardless they are residents, or those who are using roads near to construction sites. - Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction equipment and tools (e.g., dump truck, excavator, crane, jackhammer). Residents who are living beside the sites of construction works and those who are using the roads near to sites are suffering from the noise of construction. - Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the residents, which staying in the transportation corridor traverses by construction vehicles. - No hazardous waste. No painting work. Painting irrigation gates and other structures is undertaken by fabrication. - Handling oil spills from vehicle, etc. with the following steps:

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ Sprinkle sawdust or coconut husks,○ Allow the absorbent material to work on the oil for 24 to 48 hours,○ Repeat with fresh absorbent material as needed to remove any remaining oil.- Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response and evacuation route should be provided. <p>The Covid-19 prevention procedures for workers and community surrounding the project:</p> <ol style="list-style-type: none">1. Administrative Controls <p>Use administrative controls, when feasible, to reduce or eliminate the risk of exposure, such as training for construction workers on the spread of the disease in the geographic areas in which they work.</p> <ul style="list-style-type: none">▪ The signs and symptoms of Covid-19 and an explanation of how the disease is potentially spread, including the fact that infected people can spread the virus even if they do not have symptoms.▪ All policies and procedures that are applicable to the employee's duties as they relate to potential exposures to Covid-19. It is helpful to provide employees with a written copy of those standard operating procedures.▪ Information on appropriate social distancing and hygiene practices, including:<ul style="list-style-type: none">○ Avoiding physical contact with others and maintaining a distance of at least 6 feet (~ 2 m) from customers and other individuals, whenever possible, including inside work trailers.○ Appropriate cleaning practices (i.e., washing hands frequently with soap and water for at least 20 seconds, or, if soap and water are not immediately available, using alcohol-based hand sanitizer that contains at least 60% alcohol and rubbing hands until they are dry; sanitizing all surfaces workers will touch).○ The proper way to cover coughs and sneezes (i.e., sneezing or coughing into a tissue or into the upper sleeve).

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ Alternatives to shaking hands upon entry, and the importance of workers not touching their own faces (mouth, nose, eyes).○ The benefits of driving to work sites or parking areas individually, when possible, without passengers or carpools.▪ The types, proper use, limitations, location, handling, decontamination, removal, and disposal of any PPE being used.▪ The importance of staying home if they are sick.▪ Wearing masks over their noses and mouths to prevent them from spreading the virus.▪ The need to continue using other normal control measures, including PPE, necessary to protect workers from other job hazards associated with construction activities.▪ Using cleaning chemicals that have label claims against the coronavirus for cleaning frequently touched surfaces like tools, handles, and machines.▪ The need to report any safety and health concerns. <p>2. Safe Work Practices</p> <ul style="list-style-type: none">▪ To the extent possible, screen all visitors including community surrounding the project on all construction sites in advance of their arrival on the job site for signs and symptoms of Covid-19.▪ Adopt staggered work schedules, e.g., provide alternating workdays or extra shifts, to reduce the total number of employees on a job site at any given time and to ensure physical distancing.▪ Identify choke points where workers are forced to stand together, such as hallways, hoists and elevators, ingress and egress points, break areas, and buses, and implement policies to maintain social distancing.▪ Institute a rigorous housekeeping program to reduce dust levels on the job site.▪ Keep in-person meetings (including toolbox talks and safety meetings) as short as possible, limit the number of workers in attendance, and use social distancing practices.▪ Ensure clean toilet and handwashing facilities. Clean and disinfect portable job site toilets regularly. Fill hand sanitizer dispensers regularly. Disinfect frequently touched items (i.e., door pulls and toilet seats) regularly.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Source: Covid-19 Control and Prevention/ Construction Work, OSHA, United States Department of Labor.</p> <p>Watering on the road that is passed by dump trucks in a residential area periodically and limits the vehicle speed does not exceed 40 km / h when passing the area.</p> <p>Assign the flagman on roads which are often jammed by project vehicles.</p> <p>Mitigation measures: Management System on Community Health and Safety should be applied and monitored during construction and operation.</p> <p>Wearing standard Personal Protection Equipment (PPE).</p>
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	✓		Argoguruh weir is not accessible to members of the affected community throughout project construction, operation and decommissioning. There is no rehabilitation work at Argoguruh weir and around the weir is fenced and padlocked. Based on the explanation in remarks above then it is should be no community safety risks due to both accidental and natural hazards.

REA Checklist

IRRIGATION

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: Indonesia/Project Preparation Consultant Way Sekampung Irrigation System

Sector :

Subsector:

Screening Questions		Score	Remarks¹
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	1	Landslide
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	2	Topographical & geological condition
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	1	Heavy rain, floods
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): Medium risk

Other Comments: The Way Sekampung system has been established so long time with only minor risk to the performance of infrastructures,

The climate change will affect the productivity of paddy or other crops later in the far future

Prepared by: Kushartanto – Environment Specialist, Abidin Hadiarto - Irrigation Planning Design Specialist and Francois Kresno P - Assistant Hydraulic Modeling System.

¹ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

REA Checklist

IRRIGATION

Raman Utara Sub-system

Country/Project Title: Indonesia/Project Preparation Consultant Way Sekampung Irrigation System

Name of the respondents: Sugiarto, WUAF

Name of the visited area:

- Village: Sukaraja Nuban
- Sub- district: Batanghari Nuban
- District/City: East Lampung

Reminder:

- o The checklist is to be prepared to support the environmental classification of a project.
- o Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.
- o Carry a map of Protected Area.
- o Carry a camera.

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Protected Area		✓	Location of the project area is not adjacent to or within any of the following protected area. 1. Way Kambas National Park located in Lampung Timur District with a distance 12 km from project area. 2. Wan Abdul Rachman Grand Forest Park located in Pesawaran District with a distance 53 km from project area. 3. Batu Serompak Protected Forest located in Lampung Selatan District with a distance 48 km from project area.
▪ Wetland		✓	Not within or adjacent to the Project area.
▪ Mangrove		✓	Not within or adjacent to the Project area. The coastal (mangrove) area is located more than 40 km from the Project area.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ Estuarine		✓	Not within or adjacent to the Project area. The coastal (estuarine) area is located more than 40 km from the Project area.
▪ Buffer zone of protected area		✓	Not within or adjacent to the buffer zone of protected area.
▪ Special area for protecting biodiversity.		✓	Based on the discussion with <i>Dinas Lingkungan Hidup</i> /Environmental Agency, Lampung Province, there is Liwa Botanical Garden (<i>Kebun Raya Liwa/KRL</i>), however it is located in Lampung Barat District with a distance 120 km from the Project area.
B. Potential Environmental Impacts Will the Project cause...			
▪ loss of precious ecological values (e.g. result of encroachment into forests/swamplands or historical/ cultural buildings/ areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)?		✓	Works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.
▪ conflicts in water supply rights related social conflicts?	✓		During the dry season the distribution of irrigation water is disrupted, due to the reduced amount of water supply to the irrigation area. When two farmers need water at the same time, this can lead to conflict, because they both want very limited water. Farmers should coordination with the water master (ili-ili) to regulate irrigation water flow as needed before use the water.
▪ impediments to movements of people and animals?	✓		Project rehabilitation consist of sediment excavation, defect canal lining demolition and precast/concrete canal lining installation. Temporary stockpiling of sediment and debris on the edge of the canals which adjacent to the public roads (before transported by dump trucks to the disposal site) will obstruct the traffic of people and animals. Debris/demolition wastes are needed by the local people to filled up earth roads, yard and others. Installs safety line (barricade) around the storage area, traffic signs and lighting and assign the flagmen to arrange traffic are required.
▪ potential ecological problems due to increased soil erosion and siltation, leading to decreased stream capacity?		✓	According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015 are classified into erosion level I (very light). The classification consists

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			of I (very light), II (light), III (moderate), IV (heavy) and V (very heavy). No ecological value in leading to decreased stream capacity
▪ Insufficient drainage leading to salinity intrusion?	✓		Not applicable. Project area is located more than 40 km from coastal area.
▪ over pumping of groundwater, leading to salinization and ground subsidence?	✓		Not applicable. This project is surface water irrigation.
▪ impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water?	✓		There is no rehabilitation/modernization activity in the river body. Activity is carried out in the canal, both primary and secondary canals. The sequence of work is as follows: a) stoppage temporarily of irrigation water before carrying out the work. before carrying out the work. The Cropping Season adjusts to the work schedule, b) implementation of work to the completion, c) clean up the used material/remnants of work from the irrigation canals and d) irrigation water flow is opened.
▪ dislocation or involuntary resettlement of people?	✓		The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not dislocate any person, therefore no involuntary resettlement of people.
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?	✓		Lampung ethnic group consists of two indigenous groups, namely Lampung Saibatin and Lampung Pepadun. The area of Lampung Saibatin originally is located around the coast while the Pepadun is inland and hinterland, however that Indigenous People are not found surrounding the project area in Batanghari Nuban Sub-district. No disproportionate impact on Indigenous Peoples or other vulnerable groups with considering that the works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.
▪ potential social conflicts arising from land tenure and land use issues?	✓		The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site, therefore no potential social conflicts arising from land tenure and land use issues.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																		
▪ soil erosion before compaction and lining of canals?		✓	<p>Soil erosion before compaction and lining of canals would be minimum.</p> <p>The sequence of work is as follows: a) stoppage temporarily of irrigation water before implementation of the work, b) demolition of existing canal lining and land clearing for earth secondary canals, c) compaction of canals, d) lining of canal is implemented after compaction of the canal is completed along 100 m, e) clean up the used material/remnants of work from the irrigation canals, and f) irrigation water flow is opened.</p>																		
▪ noise from construction equipment?	✓		<p>Heavy equipment noise emission levels and the quantity are tabulated below:</p> <table border="1"> <thead> <tr> <th>Equipment</th><th>L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560</th><th>Unit</th></tr> </thead> <tbody> <tr> <td>Dump Truck</td><td>84</td><td>6</td></tr> <tr> <td>Excavator</td><td>85</td><td>3</td></tr> <tr> <td>Crane</td><td>85</td><td>13</td></tr> <tr> <td>Generator</td><td>82</td><td>4</td></tr> <tr> <td>Jackhammer*</td><td>85</td><td>19</td></tr> </tbody> </table> <p>* There are 82 dBA @ 7 meter rated jackhammers (90 lb. class) available. This would be equivalent to 74 dBA @ 50 ft. These are silenced with molded intricate muffler tools.</p> <p>Source:</p> <ul style="list-style-type: none"> ○ Federal Highway Administration, U.S. Department of Transportation. ○ Draft Feasibility Study Report, July 2020. <p>Workers with a full-shift average exposure above 85 dBA are required to wear hearing protection devices (either earplugs or earmuffs).</p> <p>This hearing damage can result from repeated exposure to levels above 85 dBA (such as years of working around construction noise without hearing protection).</p> <p>Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, concrete truck mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal) and noise from construction equipment and tools (e.g.,</p>	Equipment	L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560	Unit	Dump Truck	84	6	Excavator	85	3	Crane	85	13	Generator	82	4	Jackhammer*	85	19
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Jackhammer*	85	19																			

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>dump truck, excavator, crane, jackhammer). Workers in the site are using tools such as: jackhammer, concrete mixer is the most people who are suffering from exposure to construction noise. Also, residents who are living beside the sites of construction works and those who are using the roads near to sites are suffering from the noise of construction.</p> <p>Impacts of noise on human: exposure to prolonged or excessive noise has been shown to cause a range of health problems ranging from stress, poor concentration, productivity losses in the workplace, and communication difficulties and fatigue from lack of sleep, to more serious issues such as cardiovascular disease, cognitive impairment and tinnitus. The preferred way to prevent hearing damage is to reduce noise at its source. However, earplugs and earmuffs will always be necessary for some construction activities.</p> <p>Impacts of noise on wildlife: human-induced noise pollution is one of many factors contributing to the depletion of wildlife populations. Laboratory studies and limited field research have uncovered four major ways in which animals are adversely affected by noise pollution: hearing loss, resulting from noise levels of 85 dBA or greater; masking, which is the inability to hear important environmental cues and animal signals; non-auditory physiological effects, such as increased heart rate and respiration and general stress reaction; and behavioural effects, which vary greatly between species and noise characteristics, resulting in, for example, abandonment of territory and lost reproduction. Studies on Rhesus Monkeys in the laboratory have shown that a 30% increase in blood pressure following exposure to as an average 85 dBA (lower at night, higher during the day) for eight months resulted in a permanently higher blood pressure and heart rate even after one month of quiet time! (Nature Sounds Society).</p> <p>Meanwhile, impacts of noise on plant: noise pollution is altering the landscape of plants and trees, which depend on noise-affected animals to pollinate them and spread their seeds. Some plants do worse in noisy areas, a study found, while others seem to do better, depending on how the community of creatures around them changes.</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Activity at night time will be more cause nuisance to the surrounding environment.</p> <p>Impact of noise on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (12 km to 48 km) from the existing protected forest area, therefore, noise from construction activities does not cause negative impacts against animals and plants in the national park, grand forest park and protected forest areas.</p>
▪ dust during construction?	✓		<p>Dust because of vehicles: vehicles entrance and exist to the site is very important task, which generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site, this means that not only the labours will harm, but also the public.</p> <p>Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal/excavation.</p> <p>There are some people exposing and breathing dust every day regardless they are labours, residents, or those who are using roads near to construction sites.</p> <p>Dust pollution is the introduction of particulate matter that cause harm or discomfort to humans or other living organisms, or cause damage to the natural environment.</p> <p>Impacts of dust on human: in fact, dust when inhaled can increase breathing problems, damage lung tissue, and aggravate existing health problems. In addition to health concerns, dust generated from various activities can reduce visibility, resulting in accidents (Division of Genetics and Plant Propagation, India) and impacts of dust on plant: the rate of photosynthesis will decrease if the stomata on the surface of leaves be covered with dust. Therefore, if stomatal pores will be covered, then there will be decline in the process of photosynthesis</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>and ultimately the plant will die due to absence of nutrients.</p> <p>Meanwhile, impacts of dust on animals: according to the American Society for the Prevention of Cruelty to Animals (ASPCA), when allergy season hits, dust may affect the health of the pets with suffer the nagging symptom, such as a runny nose, itchy eyes and dry skin.</p> <p>Impact of dust on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (12 km to 48 km) from the existing protected forest area, therefore, dust from construction activities does not cause negative impacts against animals and plants in the national park, grand forest park and protected forest areas.</p> <p>The mitigation measures to minimize the impact, such as (i) regular watering to exposed lands by water tank which the water is taken from the nearest river; (ii) cover the tailgate with tarpaulin or plastic sheet during transporting dispersible materials to and from the site to prevent debris scattered and dust spreads to area surrounding transportation corridor traverses; (iii) the dust content due to demolition of canal lining is minimized by watering the site through water tank which the water is taken from the nearest river ; (iv) and agreement with the local community on the schedule and duration of construction works, (iv) construction workers should wear standard PPE (dust masker).</p>
▪ waterlogging and soil salinization due to inadequate drainage and farm management?	✓		<p>Extraction of materials can disrupt natural land contours and vegetation, resulting in accelerated erosion, disturbance in natural drainage patterns and waterlogging.</p> <p>So far, waterlogging in irrigation area due to reduced drainage capacity has never occurred, because excavation of sediment in the canal is always done periodically. Sediment removal plan annually by machinery in main canal is 1,960 m³, meanwhile sediment removal by man power 1 m depth in secondary canal is 132 m³ (Draft Feasibility Study Report, July 2020).</p>
▪ leaching of soil nutrients and changes in soil characteristics		✓	Farmers saving irrigation water, do not inundate land when planting paddy (transplanting), there is no swift

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																													
due to excessive application of irrigation water?			flow of water that transport soil nutrient out of paddy fields.																													
▪ reduction of downstream water supply during peak seasons?	✓		<p>Reduction of downstream water supply occurred during dry seasons, which the required discharge is insufficient to irrigate the entire irrigation area, so that most of the discharge is flowed into the irrigation area. In this condition, water supply to downstream of the Argoguruh weir is limited.</p> <p>However, the case did not continue until the conflict.</p>																													
▪ soil pollution, polluted farm runoff and groundwater, and public health risks due to excessive application of fertilizers and pesticides?		✓	<p>No excessive application of fertilizers and pesticides. Integrated Crop Management (ICM) and Integrated Pest Management (IPM) have been applied by most farmers to use fertilizer according to the need and promote on using organic fertilizer.</p> <p>Application of ICM and IPM in the field will follow the instruction of PPL (<i>Penyuluhan Pertanian Lapangan</i>/ Field Extension Worker). PPL conducts an extension to the farmers every 2 to 3 weeks.</p> <p>Water quality of Way Sekampung River in downstream area in some locations related to application of fertilizers in Way Sekampung Irrigation System, as follows:</p> <table border="1"> <thead> <tr> <th rowspan="2">Parameter</th> <th>Apr 2009</th> <th>May 2009</th> <th>Jun 2009</th> <th>Water Quality Standard Class IV</th> </tr> <tr> <th colspan="4">mg/L</th> </tr> </thead> <tbody> <tr> <td>Nitrate Nitrogen (NO₃ - N)</td> <td>1.5678</td> <td>0.9716</td> <td>0.6629</td> <td><20</td> </tr> <tr> <td>Nitrite Nitrogen (NO₂ - N)</td> <td>0.1662</td> <td>0.1682</td> <td>0.0131</td> <td>-</td> </tr> <tr> <td>Ammonia (NH₃ - N)</td> <td>0.8113</td> <td>0.5818</td> <td>0.5239</td> <td>-</td> </tr> <tr> <td>Phosphate</td> <td>0.1161</td> <td>0.1467</td> <td>0.2188</td> <td>5</td> </tr> </tbody> </table> <p>Source: BPLHD, Regional Environmental Status Data Book, Lampung Province, 2009</p> <p>Measurement in Gunung Raya Village, Sekampung Udik Sub district, East Lampung District.</p>	Parameter	Apr 2009	May 2009	Jun 2009	Water Quality Standard Class IV	mg/L				Nitrate Nitrogen (NO ₃ - N)	1.5678	0.9716	0.6629	<20	Nitrite Nitrogen (NO ₂ - N)	0.1662	0.1682	0.0131	-	Ammonia (NH ₃ - N)	0.8113	0.5818	0.5239	-	Phosphate	0.1161	0.1467	0.2188	5
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REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks									
			Parameter	Apr 2009	May 2009	Jun 2009	Water Quality Standard Class IV					
				mg/L								
			Nitrate Nitrogen (NO ₃ - N)	1.115	1.2169	0.4887	<20					
			Nitrite Nitrogen (NO ₂ - N)	0.1319	0.1319	0.0124	-					
			Ammonia (NH ₃ - N)	0.6432	0.2756	0.3206	-					
▪ soil erosion (furrow, surface)?		✓	Source: BPLHD, Regional Environmental Status Data Book, Lampung Province, 2009									
Measurement in Margo Toto Village, Metro Kibang Sub District, South Lampung District.												
According to the contents of Nitrate Nitrogen, Nitrite Nitrogen, Ammonia and Phosphate showed still far below the standard.												
▪ scouring canals?		✓	According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015, the Project area is classified into erosion level I (very light). The classification: I (very light), II (light), III (moderate), IV (heavy) and V (very heavy).									
▪ clogging of canals by sediments?		✓	No scouring canals. Canal slope with concrete lining along the feeder canals and primary canals, meanwhile canals slope and canal bed with concrete lining along the secondary canals. The canal gradient 0.0003 and flow velocity 0.5 m/sec to 1.4 m/sec appropriate with the design standards (Draft Feasibility Study Report, July 2020).									
▪ clogging of canals by weeds?		✓	Sedimentation occurs at the ends of primary and secondary canals, because water flow slows down and even stops when the water gates are clogged by sediment / rubbish. Coordination with the water master or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.									

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			Coordination with the water master (Ili-ili) or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.
▪ seawater intrusion into downstream freshwater systems?	✓		Not applicable. Irrigation area not located in coastal area.
▪ introduction of increase in incidence of waterborne or water related diseases?		✓	<p>Information collected from Public Health Centre related is a matter of household sanitation, clean water sources, Public Health Centre programs, and free defecation programs conducted with village offices and the top 10 diseases in one year based on the number of patient visits. Water-borne diseases that enter the top ten are dominated by diarrhoea and dermatitis. At the top, it is dominated by airborne diseases such as upper respiratory tract infection. However, non-infectious diseases have started to move up in the top ten.</p> <p>A pre-formulated questionnaire was used to interview respondents containing questions about personal data, characteristics of farmers, duration of contact with irrigation water, use of pesticides and fertilizers, use of personal protective equipment, availability of clean water and household sanitation. The survey was conducted in a sample of 31 villages and 210 farmer interviews which form the sample for assessing community health in the Way Sekampung Irrigation System.</p> <p>Waterborne diseases occur due to poor hygiene, household sanitation and bad quality of clean water sources. These diseases can be transmitted by waterborne, such as diarrhoea, dysentery, cholera, polio, typhoid, hepatitis, meningitis. Interviewing farmers indicated low levels of waterborne diseases within the Way Sekampung Irrigation System. It is noted that one farmer was infected with dengue fever, one person suffered diarrhoea, and one person had typhoid and 8 person's dermatitis. In total, this amounts to only 5% of the sample. Other infectious diseases that occur anecdotal are cough, flu, and fever. The amount is 2% of the sample. Non-infectious diseases reported are rheumatic pain, headache, and gastritis, for 6% of the sample. Non-infectious diseases have been shifting to the top ten diseases in Way Sekampung Irrigation System (Draft Feasibility Study Report, Supplement I Public Health Report, July 2020).</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ dangers to a safe and healthy working environment due to physical, chemical and biological hazards during project construction and operation?	✓		<p>No chemical and biological materials used during project construction and operation.</p> <p>Dangers to a safe and healthy working environment due to hazards during project construction, such as:</p> <ul style="list-style-type: none"> - Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the workers. - Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site will harm the labours. - Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal. - There are some people exposing and breathing dust every day regardless they are labours of construction work. - Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction tools (e.g., jackhammer). Workers in the site are using equipment and tools such as: dump truck, excavator, crane, jackhammer and concrete mixer are the most people who are suffering from exposure to construction noise. - Workers in the site are using jackhammer are suffering from exposure to construction vibration. - Installation of precast canal lining in primary canal by the crane. The movement of workers in the canal (right and left sides) by passing the ladder placed on the slope of the canal. Average height of primary canals is 6.0 m. Placement of the ladder on unstable site may cause the ladder to collapse and worker to fall.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none"> - Meanwhile, the installation of concrete canal lining in the secondary canal by a Concrete Truck Mixer. Movement of workers in the canal (right and left sides) by crossing temporary pedestrian bridge placed on both sides of the canal. Average height of secondary canals is 2.5 m. Placement of the bridge at a fragile location, not strong bridge material and the absence of a hand rail may cause to collapse of the bridge and the fall of passing workers. - Workers should wear standard PPE (helmet, gloves/vibration-damping gloves, safety boots, ear protection and face protection). <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area.</p> <p>Some locations will be occupied for Base camp, warehouse, fuel tank and heavy equipment parking for project rehabilitation.</p> <p>Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response plan and evacuation route should be provided.</p>
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?	✓		<p>Total workforce during project rehabilitation is 445 persons, which around 75% of the total workforce as unskilled labourers employed from surrounding residents and they will live in their respective homes, therefore there are not any a large population influx. Recruits local labour profusely.</p> <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area. This condition not likely to causes increased burden on social infrastructure and services (such as water supply and sanitation systems).</p>
▪ social conflicts if workers from other regions or countries are hired?	✓		<p>Many unskilled workers, bricklayer, drivers and securities are available for project construction in surrounding project area.</p> <p>Priority for local workers.</p>
▪ risks to community health and safety due to the transport, storage, and use and/or disposal	✓		<p>There is no transport, storage, and use and/or disposal of materials such as explosives and other chemicals during construction and operation.</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
of materials such as explosives, fuel and other chemicals during construction and operation?			<p>Risks to community health and safety due to the transport, storage, and use and/or disposal of materials during construction, such as:</p> <ul style="list-style-type: none">- Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site will harm the public.- Dust because of construction activities: the majority of construction activities causes an effect on the environment, due to generates amount of dust. Project location is adjacent to residential area. These activities such as canal lining demolition and sediment removal/excavation.- There are some people exposing and breathing dust every day regardless they are residents, or those who are using roads near to construction sites.- Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction equipment and tools (e.g., dump truck, excavator, crane, jackhammer). Residents who are living beside the sites of construction works and those who are using the roads near to sites are suffering from the noise of construction.- Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the residents, which staying in the transportation corridor traverses by construction vehicles.- No hazardous waste. No painting work. Painting irrigation gates and other structures is undertaken by fabrication.- Handling oil spills from vehicle, etc. with the following steps:<ul style="list-style-type: none">o Sprinkle sawdust or coconut husks,o Allow the absorbent material to work on the oil for 24 to 48 hours,

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ Repeat with fresh absorbent material as needed to remove any remaining oil.- Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response and evacuation route should be provided. <p>The Covid-19 prevention procedures for workers and community surrounding the project:</p> <ol style="list-style-type: none">1. Administrative Controls <p>Use administrative controls, when feasible, to reduce or eliminate the risk of exposure, such as training for construction workers on the spread of the disease in the geographic areas in which they work.</p> <ul style="list-style-type: none">▪ The signs and symptoms of Covid-19 and an explanation of how the disease is potentially spread, including the fact that infected people can spread the virus even if they do not have symptoms.▪ All policies and procedures that are applicable to the employee's duties as they relate to potential exposures to Covid-19. It is helpful to provide employees with a written copy of those standard operating procedures.▪ Information on appropriate social distancing and hygiene practices, including:<ul style="list-style-type: none">○ Avoiding physical contact with others and maintaining a distance of at least 6 feet (~ 2 m) from customers and other individuals, whenever possible, including inside work trailers.○ Appropriate cleaning practices (i.e., washing hands frequently with soap and water for at least 20 seconds, or, if soap and water are not immediately available, using alcohol-based hand sanitizer that contains at least 60% alcohol and rubbing hands until they are dry; sanitizing all surfaces workers will touch).○ The proper way to cover coughs and sneezes (i.e., sneezing or coughing into a tissue or into the upper sleeve).○ Alternatives to shaking hands upon entry, and the importance of workers not touching their own faces (mouth, nose, eyes).

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ The benefits of driving to work sites or parking areas individually, when possible, without passengers or carpools.▪ The types, proper use, limitations, location, handling, decontamination, removal, and disposal of any PPE being used.▪ The importance of staying home if they are sick.▪ Wearing masks over their noses and mouths to prevent them from spreading the virus.▪ The need to continue using other normal control measures, including PPE, necessary to protect workers from other job hazards associated with construction activities.▪ Using cleaning chemicals that have label claims against the coronavirus for cleaning frequently touched surfaces like tools, handles, and machines.▪ The need to report any safety and health concerns. <p>2. Safe Work Practices</p> <ul style="list-style-type: none">▪ To the extent possible, screen all visitors including community surrounding the project on all construction sites in advance of their arrival on the job site for signs and symptoms of Covid-19.▪ Adopt staggered work schedules, e.g., provide alternating workdays or extra shifts, to reduce the total number of employees on a job site at any given time and to ensure physical distancing.▪ Identify choke points where workers are forced to stand together, such as hallways, hoists and elevators, ingress and egress points, break areas, and buses, and implement policies to maintain social distancing.▪ Institute a rigorous housekeeping program to reduce dust levels on the job site.▪ Keep in-person meetings (including toolbox talks and safety meetings) as short as possible, limit the number of workers in attendance, and use social distancing practices.▪ Ensure clean toilet and handwashing facilities. Clean and disinfect portable job site toilets regularly. Fill hand sanitizer dispensers regularly. Disinfect frequently touched items (i.e., door pulls and toilet seats) regularly.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Source: Covid-19 Control and Prevention/ Construction Work, OSHA, United States Department of Labor.</p> <p>Watering on the road that is passed by dump trucks in a residential area periodically and limits the vehicle speed does not exceed 40 km / h when passing the area.</p> <p>Assign the flagman on roads which are often jammed by project vehicles</p> <p>Mitigation measures: Management System on Community Health and Safety should be applied and monitored during construction and operation.</p> <p>Wearing standard Personal Protection Equipment (PPE).</p>
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	✓		Argoguruh weir is not accessible to members of the affected community throughout project construction, operation and decommissioning. There is no rehabilitation work at Argoguruh weir and around the weir is fenced and padlocked. Based on the explanation in remarks above then it is should be no community safety risks due to both accidental and natural hazards.

REA Checklist

IRRIGATION

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: Indonesia/Project Preparation Consultant Way Sekampung Irrigation System

Sector :

Subsector:

Screening Questions		Score	Remarks¹
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	1	Landslide
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	2	Topographical & geological condition
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	1	Heavy rain, floods
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): Medium risk

Other Comments: The Way Sekampung system has been established so long time with only minor risk to the performance of infrastructures,

The climate change will affect the productivity of paddy or other crops later in the far future

Prepared by: Kushartanto – Environment Specialist, Abidin Hadiarto - Irrigation Planning Design Specialist and Francois Kresno P - Assistant Hydraulic Modeling System.

¹ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

REA Checklist

IRRIGATION

Sekampung Batanghari Sub-system

Country/Project Title: Indonesia/Project Preparation Consultant Way Sekampung Irrigation System

Name of the respondents: Sakiran, WUAA

Name of the visited area:

- Village: Hargo Mulyo
- Sub- district: Sekampung
- District/City: East Lampung

Reminder:

- The checklist is to be prepared to support the environmental classification of a project.
- Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.
- Carry a map of Protected Area.
- Carry a camera.

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Protected Area		✓	Location of the project area is not adjacent to or within any of the following protected area. 1. Way Kambas National Park located in Lampung Timur District with a distance 23 km from project area. 2. Wan Abdul Rachman Grand Forest Park located in Pesawaran District with a distance 31 km from project area. 3. Gunung Balak Protected Forest located in Lampung Timur District with a distance 16 km from project area.
▪ Wetland		✓	Not within or adjacent to the Project area.
▪ Mangrove		✓	Not within or adjacent to the Project area. The coastal (mangrove) area is located more than 35 km from the Project area.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ Estuarine		✓	Not within or adjacent to the Project area. The coastal (estuarine) area is located more than 35 km from the Project area.
▪ Buffer zone of protected area		✓	Not within or adjacent to the buffer zone of protected area.
▪ Special area for protecting biodiversity		✓	Based on the discussion with <i>Dinas Lingkungan Hidup</i> /Environmental Agency, Lampung Province, there is Liwa Botanical Garden (<i>Kebun Raya Liwa/KRL</i>), however it is located in Lampung Barat District with a distance 120 km from the Project area.
B. Potential Environmental Impacts Will the Project cause...			
▪ loss of precious ecological values (e.g. result of encroachment into forests/swamplands or historical/ cultural buildings/ areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)?		✓	Works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.
▪ conflicts in water supply rights related social conflicts?	✓		During the dry season the distribution of irrigation water is disrupted, due to the reduced amount of water supply to the irrigation area. When two farmers need water at the same time, this can lead to conflict, because they both want very limited water. Farmers should coordination with the water master (ili-ili) to regulate irrigation water flow as needed before use the water.
▪ impediments to movements of people and animals?	✓		Project rehabilitation consist of sediment excavation, defect canal lining demolition and precast/concrete canal lining installation. Temporary stockpiling of sediment and debris on the edge of the canals which adjacent to the public roads (before transported by dump trucks to the disposal site) will obstruct the traffic of people and animals. Debris/demolition wastes are needed by the local people to filled up earth roads, yard and others. Installs safety line (barricade) around the storage area, traffic signs and lighting and assign the flagmen to arrange traffic are required.
▪ potential ecological problems due to increased soil erosion and siltation, leading to decreased stream capacity?		✓	According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015 are classified into erosion level I (very light). The classification consists

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			of I (very light), II (light), III (moderate), IV (heavy) and V (very heavy). No ecological value in leading to decreased stream capacity
▪ Insufficient drainage leading to salinity intrusion?	✓		Not applicable. Project area is located more than 40 km from coastal area.
▪ over pumping of groundwater, leading to salinization and ground subsidence?	✓		Not applicable. This project is surface water irrigation.
▪ impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water?	✓		There is no rehabilitation/modernization activity in the river body. Activity is carried out in the canal, both primary and secondary canals. The sequence of work is as follows: a) stoppage temporarily of irrigation water before carrying out the work. before carrying out the work. The Cropping Season adjusts to the work schedule, b) implementation of work to the completion, c) clean up the used material/remnants of work from the irrigation canals and d) irrigation water flow is opened.
▪ dislocation or involuntary resettlement of people?	✓		The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not dislocate any person, therefore no involuntary resettlement of people.
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?	✓		Lampung ethnic group consists of two indigenous groups, namely Lampung Saibatin and Lampung Pepadun. The area of Lampung Saibatin originally is located around the coast while the Pepadun is inland and hinterland, however that Indigenous People are not found surrounding the project area in Sekampung Sub-district. No disproportionate impact on Indigenous Peoples or other vulnerable groups with considering that the works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.
▪ potential social conflicts arising from land tenure and land use issues?	✓		The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site, therefore no potential social conflicts arising from land tenure and land use issues.
▪ soil erosion before compaction and lining of canals?	✓		Soil erosion before compaction and lining of canals would be minimum.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																		
			<p>The sequence of work is as follows: a) stoppage temporarily of irrigation water before implementation of the work, b) demolition of existing canal lining and land clearing for earth secondary canals, c) compaction of canals, d) lining of canal is implemented after compaction of the canal is completed along 100 m, e) clean up the used material/remnants of work from the irrigation canals, and f) irrigation water flow is opened.</p>																		
▪ noise from construction equipment?	✓		<p>Heavy equipment noise emission levels and the quantity are tabulated below:</p> <table border="1"> <thead> <tr> <th>Equipment</th><th>L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560</th><th>Unit</th></tr> </thead> <tbody> <tr> <td>Dump Truck</td><td>84</td><td>4</td></tr> <tr> <td>Excavator</td><td>85</td><td>2</td></tr> <tr> <td>Crane</td><td>85</td><td>13</td></tr> <tr> <td>Generator</td><td>82</td><td>7</td></tr> <tr> <td>Jackhammer*</td><td>85</td><td>19</td></tr> </tbody> </table> <p>* There are 82 dBA @ 7 meter rated jackhammers (90 lb. class) available. This would be equivalent to 74 dBA @ 50 ft. These are silenced with molded intricate muffler tools.</p> <p>Source:</p> <ul style="list-style-type: none"> ○ Federal Highway Administration, U.S. Department of Transportation. ○ Draft Feasibility Study Report, July 2020. <p>Workers with a full-shift average exposure above 85 dBA are required to wear hearing protection devices (either earplugs or earmuffs).</p> <p>This hearing damage can result from repeated exposure to levels above 85 dBA (such as years of working around construction noise without hearing protection).</p> <p>Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, concrete truck mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal) and noise from construction equipment and tools (e.g., dump truck, excavator, crane, jackhammer). Workers in the site are using tools such as: jackhammer, concrete</p>	Equipment	L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560	Unit	Dump Truck	84	4	Excavator	85	2	Crane	85	13	Generator	82	7	Jackhammer*	85	19
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REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>mixer is the most people who are suffering from exposure to construction noise. Also residents who are living beside the sites of construction works and those who are using the roads near to sites are suffering from the noise of construction.</p> <p>Impacts of noise on human: exposure to prolonged or excessive noise has been shown to cause a range of health problems ranging from stress, poor concentration, productivity losses in the workplace, and communication difficulties and fatigue from lack of sleep, to more serious issues such as cardiovascular disease, cognitive impairment and tinnitus.</p> <p>The preferred way to prevent hearing damage is to reduce noise at its source. However, earplugs and earmuffs will always be necessary for some construction activities.</p> <p>Impacts of noise on wildlife: human-induced noise pollution is one of many factors contributing to the depletion of wildlife populations. Laboratory studies and limited field research have uncovered four major ways in which animals are adversely affected by noise pollution: hearing loss, resulting from noise levels of 85 dBA or greater; masking, which is the inability to hear important environmental cues and animal signals; non-auditory physiological effects, such as increased heart rate and respiration and general stress reaction; and behavioural effects, which vary greatly between species and noise characteristics, resulting in, for example, abandonment of territory and lost reproduction. Studies on Rhesus Monkeys in the laboratory have shown that a 30% increase in blood pressure following exposure to an average 85 dBA (lower at night, higher during the day) for eight months resulted in a permanently higher blood pressure and heart rate even after one month of quiet time! (Nature Sounds Society).</p> <p>Meanwhile, impacts of noise on plant: noise pollution is altering the landscape of plants and trees, which depend on noise-affected animals to pollinate them and spread their seeds. Some plants do worse in noisy areas, a study found, while others seem to do better, depending on how the community of creatures around them changes.</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Activity at night time will be more cause nuisance to the surrounding environment.</p> <p>Impact of noise on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (16 km to 31 km) from the existing protected forest area, therefore, noise from construction activities does not cause negative impacts against animals and plants in the national park, grand forest park, and protected forest areas.</p>
▪ dust during construction?	✓		<p>Dust because of vehicles: vehicles entrance and exist to the site is very important task, which generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site, this means that not only the labours will harm, but also the public.</p> <p>Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal/excavation.</p> <p>There are some people exposing and breathing dust every day regardless they are labours, residents, or those who are using roads near to construction sites.</p> <p>Dust pollution is the introduction of particulate matter that cause harm or discomfort to humans or other living organisms, or cause damage to the natural environment.</p> <p>Impacts of dust on human: in fact, dust when inhaled can increase breathing problems, damage lung tissue, and aggravate existing health problems. In addition to health concerns, dust generated from various activities can reduce visibility, resulting in accidents (Division of Genetics and Plant Propagation, India) and impacts of dust on plant: the rate of photosynthesis will decrease if the stomata on the surface of leaves be covered with dust. Therefore, if stomatal pores will be covered, then there will be decline in the process of photosynthesis</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>and ultimately the plant will die due to absence of nutrients.</p> <p>Meanwhile, impacts of dust on animals: according to the American Society for the Prevention of Cruelty to Animals (ASPCA), when allergy season hits, dust may affect the health of the pets with suffer the nagging symptom, such as a runny nose, itchy eyes and dry skin.</p> <p>Impact of dust on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (16 km to 31 km) from the existing protected forest area, therefore, dust from construction activities does not cause negative impacts against animals and plants in the national park, grand forest park and protected forest areas.</p> <p>The mitigation measures to minimize the impact, such as (i) regular watering to exposed lands by water tank which the water is taken from the nearest river; (ii) cover the tailgate with tarpaulin or plastic sheet during transporting dispersible materials to and from the site to prevent debris scattered and dust spreads to area surrounding transportation corridor traverses; (iii) the dust content due to demolition of canal lining is minimized by watering the site through water tank which the water is taken from the nearest river ; (iv) and agreement with the local community on the schedule and duration of construction works, (iv) construction workers should wear standard PPE (dust masker).</p>
▪ waterlogging and soil salinization due to inadequate drainage and farm management?	✓		<p>Extraction of materials can disrupt natural land contours and vegetation, resulting in accelerated erosion, disturbance in natural drainage patterns and waterlogging.</p> <p>So far, waterlogging in irrigation area due to reduced drainage capacity has never occurred, because excavation of sediment in the canal is always done periodically. Sediment removal plan annually by machinery in main canal is 2,940 m³, meanwhile sediment removal by man power 1 m depth in secondary canal is 318 m³ (Draft Feasibility Study Report, July 2020).</p>
▪ leaching of soil nutrients and changes in soil characteristics		✓	Farmers saving irrigation water, do not inundate land when planting paddy (transplanting), there is no swift

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																													
due to excessive application of irrigation water?			flow of water that transport soil nutrient out of paddy fields.																													
▪ reduction of downstream water supply during peak seasons?	✓		<p>Reduction of downstream water supply occurred during dry seasons, which the required discharge is insufficient to irrigate the entire irrigation area, so that most of the discharge is flowed into the irrigation area. In this condition, water supply to downstream of the Argoguruh weir is limited.</p> <p>However, the case did not continue until the conflict.</p>																													
▪ soil pollution, polluted farm runoff and groundwater, and public health risks due to excessive application of fertilizers and pesticides?		✓	<p>No excessive application of fertilizers and pesticides. Integrated Crop Management (ICM) and Integrated Pest Management (IPM) have been applied by most farmers to use fertilizer according to the need and promote on using organic fertilizer.</p> <p>Application of ICM and IPM in the field will follow the instruction of PPL (<i>Penyuluhan Pertanian Lapangan</i>/ Field Extension Worker). PPL conducts an extension to the farmers every 2 to 3 weeks.</p> <p>Water quality of Way Sekampung River in downstream area in some locations related to application of fertilizers in Way Sekampung Irrigation System, as follows:</p> <table border="1"> <thead> <tr> <th rowspan="2">Parameter</th> <th>Apr 2009</th> <th>May 2009</th> <th>Jun 2009</th> <th>Water Quality Standard Class IV</th> </tr> <tr> <th colspan="4">mg/L</th> </tr> </thead> <tbody> <tr> <td>Nitrate Nitrogen (NO₃ - N)</td> <td>1.5678</td> <td>0.9716</td> <td>0.6629</td> <td><20</td> </tr> <tr> <td>Nitrite Nitrogen (NO₂ - N)</td> <td>0.1662</td> <td>0.1682</td> <td>0.0131</td> <td>-</td> </tr> <tr> <td>Ammonia (NH₃ - N)</td> <td>0.8113</td> <td>0.5818</td> <td>0.5239</td> <td>-</td> </tr> <tr> <td>Phosphate</td> <td>0.1161</td> <td>0.1467</td> <td>0.2188</td> <td>5</td> </tr> </tbody> </table> <p>Source: BPLHD, Regional Environmental Status Data Book, Lampung Province, 2009</p> <p>Measurement in Gunung Raya Village, Sekampung Udik Sub district, East Lampung District.</p>	Parameter	Apr 2009	May 2009	Jun 2009	Water Quality Standard Class IV	mg/L				Nitrate Nitrogen (NO ₃ - N)	1.5678	0.9716	0.6629	<20	Nitrite Nitrogen (NO ₂ - N)	0.1662	0.1682	0.0131	-	Ammonia (NH ₃ - N)	0.8113	0.5818	0.5239	-	Phosphate	0.1161	0.1467	0.2188	5
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REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks				
			Parameter	Apr 2009	May 2009	Jun 2009	Water Quality Standard Class IV
				mg/L			
			Nitrate Nitrogen (NO ₃ - N)	1.115	1.2169	0.4887	<20
			Nitrite Nitrogen (NO ₂ - N)	0.1319	0.1319	0.0124	-
			Ammonia (NH ₃ - N)	0.6432	0.2756	0.3206	-
▪ soil erosion (furrow, surface)?		✓	Source: BPLHD, Regional Environmental Status Data Book, Lampung Province, 2009				
▪ scouring canals?		✓	Measurement in Margo Toto Village, Metro Kibang Sub District, South Lampung District.				
▪ clogging of canals by sediments?	✓		According to the contents of Nitrate Nitrogen, Nitrite Nitrogen, Ammonia and Phosphate showed still far below the standard.				
▪ clogging of canals by weeds?	✓		According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015, the Project area is classified into erosion level I (very light). The classification: I (very light), II (light), III (moderate), IV (heavy) and V (very heavy).				
			No scouring canals. Canal slope with concrete lining along the feeder canals and primary canals, meanwhile canals slope and canal bed with concrete lining along the secondary canals. The canal gradient 0.0003 and flow velocity 0.5 m/sec to 1.4 m/sec appropriate with the design standards (Draft Feasibility Study Report, July 2020).				
			Sedimentation occurs at the ends of primary and secondary canals, because water flow slows down and even stops when the water gates are clogged by sediment / rubbish.				
			Coordination with the water master or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.				
			Sedimentation occurs at the ends of primary and secondary canals, because water flow slows down and even stops when the water gates are clogged by weed (water hyacinth).				

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			Coordination with the water master or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.
▪ seawater intrusion into downstream freshwater systems?	✓		Not applicable. Irrigation area not located in coastal area.
▪ introduction of increase in incidence of waterborne or water related diseases?		✓	<p>Information collected from Public Health Centre related is a matter of household sanitation, clean water sources, Public Health Centre programs, and free defecation programs conducted with village offices and the top 10 diseases in one year based on the number of patient visits. Water-borne diseases that enter the top ten are dominated by diarrhoea and dermatitis. At the top, it is dominated by airborne diseases such as upper respiratory tract infection. However, non-infectious diseases have started to move up in the top ten</p> <p>A pre-formulated questionnaire was used to interview respondents containing questions about personal data, characteristics of farmers, duration of contact with irrigation water, use of pesticides and fertilizers, use of personal protective equipment, availability of clean water and household sanitation. The survey was conducted in a sample of 31 villages and 210 farmer interviews which form the sample for assessing community health in the Way Sekampung Irrigation System.</p> <p>Waterborne diseases occur due to poor hygiene, household sanitation and bad quality of clean water sources. These diseases can be transmitted by waterborne, such as diarrhoea, dysentery, cholera, polio, typhoid, hepatitis, meningitis. Interviewing farmers indicated low levels of waterborne diseases within the Way Sekampung Irrigation System. It is noted that one farmer was infected with dengue fever, one person suffered diarrhoea, and one person had typhoid and 8 person's dermatitis. In total, this amounts to only 5% of the sample. Other infectious diseases that occur anecdotal are cough, flu, and fever. The amount is 2% of the sample. Non-infectious diseases reported are rheumatic pain, headache, and gastritis, for 6% of the sample. Non-infectious diseases have been shifting to the top ten diseases in Way Sekampung Irrigation System (Draft Feasibility Study Report, Supplement I Public Health Report, July 2020).</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ dangers to a safe and healthy working environment due to physical, chemical and biological hazards during project construction and operation?	✓		<p>No chemical and biological materials used during project construction and operation.</p> <p>Dangers to a safe and healthy working environment due to hazards during project construction, such as:</p> <ul style="list-style-type: none">- Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the workers.- Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dusts out the site will harm the labours.- Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal.- There are some people exposing and breathing dust every day regardless they are labours of construction work.- Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction tools (e.g., jackhammer). Workers in the site are using equipment and tools such as: dump truck, excavator, crane, jackhammer and concrete mixer are the most people who are suffering from exposure to construction noise.- Workers in the site are using jackhammer are suffering from exposure to construction vibration.- Installation of precast canal lining in primary canal by the crane. The movement of workers in the canal (right and left sides) by passing the ladder placed on the slope of the canal. Average height of primary canals is 6.0 m. Placement of the ladder on unstable site may cause the ladder to collapse and worker to fall.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none"> - Meanwhile, the installation of concrete canal lining in the secondary canal by a Concrete Truck Mixer. Movement of workers in the canal (right and left sides) by crossing temporary pedestrian bridge placed on both sides of the canal. Average height of secondary canals is 2.5 m. Placement of the bridge at a fragile location, not strong bridge material and the absence of a hand rail may cause to collapse of the bridge and the fall of passing workers. - Workers should wear standard PPE (helmet, gloves/vibration-damping gloves, safety boots, ear protection and face protection). <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area.</p> <p>Some locations will be occupied for Base camp, warehouse, fuel tank and heavy equipment parking for project rehabilitation.</p> <p>Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response plan and evacuation route should be provided.</p>
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?	✓		<p>Total workforce during project rehabilitation is 313 persons, which around 75% of the total workforce as unskilled labourers employed from surrounding residents and they will live in their respective homes, therefore there are not any a large population influx. Recruits local labour profusely.</p> <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area. This condition not likely to causes increased burden on social infrastructure and services (such as water supply and sanitation systems).</p>
▪ social conflicts if workers from other regions or countries are hired?	✓		<p>Many unskilled workers, bricklayer, drivers and securities are available for project construction in surrounding project area.</p> <p>Priority for local workers.</p>
▪ risks to community health and safety due to the transport, storage, and use and/or disposal	✓		<p>There is no transport, storage, and use and/or disposal of materials such as explosives and other chemicals during construction and operation.</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
of materials such as explosives, fuel and other chemicals during construction and operation?			<p>Risks to community health and safety due to the transport, storage, and use and/or disposal of materials during construction, such as:</p> <ul style="list-style-type: none">- Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site will harm the public.- Dust because of construction activities: the majority of construction activities causes an effect on the environment, due to generates amount of dust. Project location is adjacent to residential area. These activities such as canal lining demolition and sediment removal/excavation.- There are some people exposing and breathing dust every day regardless they are residents, or those who are using roads near to construction sites.- Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction equipment and tools (e.g., dump truck, excavator, crane, jackhammer). Residents who are living beside the sites of construction works and those who are using the roads near to sites are suffering from the noise of construction.- Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the residents, which staying in the transportation corridor traverses by construction vehicles.- No hazardous waste. No painting work. Painting irrigation gates and other structures is undertaken by fabrication.- Handling oil spills from vehicle, etc. with the following steps:<ul style="list-style-type: none">o Sprinkle sawdust or coconut husks,o Allow the absorbent material to work on the oil for 24 to 48 hours,

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ Repeat with fresh absorbent material as needed to remove any remaining oil.- Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response and evacuation route should be provided. <p>The Covid-19 prevention procedures for workers and community surrounding the project:</p> <ol style="list-style-type: none">1. Administrative Controls <p>Use administrative controls, when feasible, to reduce or eliminate the risk of exposure, such as training for construction workers on the spread of the disease in the geographic areas in which they work.</p> <ul style="list-style-type: none">▪ The signs and symptoms of Covid-19 and an explanation of how the disease is potentially spread, including the fact that infected people can spread the virus even if they do not have symptoms.▪ All policies and procedures that are applicable to the employee's duties as they relate to potential exposures to Covid-19. It is helpful to provide employees with a written copy of those standard operating procedures.▪ Information on appropriate social distancing and hygiene practices, including:<ul style="list-style-type: none">○ Avoiding physical contact with others and maintaining a distance of at least 6 feet (~ 2 m) from customers and other individuals, whenever possible, including inside work trailers.○ Appropriate cleaning practices (i.e., washing hands frequently with soap and water for at least 20 seconds, or, if soap and water are not immediately available, using alcohol-based hand sanitizer that contains at least 60% alcohol and rubbing hands until they are dry; sanitizing all surfaces workers will touch).○ The proper way to cover coughs and sneezes (i.e., sneezing or coughing into a tissue or into the upper sleeve).○ Alternatives to shaking hands upon entry, and the importance of workers not touching their own faces (mouth, nose, eyes).

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ The benefits of driving to work sites or parking areas individually, when possible, without passengers or carpools.▪ The types, proper use, limitations, location, handling, decontamination, removal, and disposal of any PPE being used.▪ The importance of staying home if they are sick.▪ Wearing masks over their noses and mouths to prevent them from spreading the virus.▪ The need to continue using other normal control measures, including PPE, necessary to protect workers from other job hazards associated with construction activities.▪ Using cleaning chemicals that have label claims against the coronavirus for cleaning frequently touched surfaces like tools, handles, and machines.▪ The need to report any safety and health concerns. <p>2. Safe Work Practices</p> <ul style="list-style-type: none">▪ To the extent possible, screen all visitors including community surrounding the project on all construction sites in advance of their arrival on the job site for signs and symptoms of Covid-19.▪ Adopt staggered work schedules, e.g., provide alternating workdays or extra shifts, to reduce the total number of employees on a job site at any given time and to ensure physical distancing.▪ Identify choke points where workers are forced to stand together, such as hallways, hoists and elevators, ingress and egress points, break areas, and buses, and implement policies to maintain social distancing.▪ Institute a rigorous housekeeping program to reduce dust levels on the job site.▪ Keep in-person meetings (including toolbox talks and safety meetings) as short as possible, limit the number of workers in attendance, and use social distancing practices.▪ Ensure clean toilet and handwashing facilities. Clean and disinfect portable job site toilets regularly. Fill hand sanitizer dispensers regularly. Disinfect frequently touched items (i.e., door pulls and toilet seats) regularly.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Source: Covid-19 Control and Prevention/ Construction Work, OSHA, United States Department of Labor.</p> <p>Watering on the road that is passed by dump trucks in a residential area periodically and limits the vehicle speed does not exceed 40 km / h when passing the area.</p> <p>Assign the flagman on roads which are often jammed by project vehicles</p> <p>Mitigation measures: Management System on Community Health and Safety should be applied and monitored during construction and operation.</p> <p>Wearing standard Personal Protection Equipment (PPE).</p>
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	✓		Argoguruh weir is not accessible to members of the affected community throughout project construction, operation and decommissioning. There are no rehabilitation work at Argoguruh weir and around the weir is fenced and padlocked. Based on the explanation in remarks above then it is should be no community safety risks due to both accidental and natural hazards.

REA Checklist

IRRIGATION

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: Indonesia/Project Preparation Consultant Way Sekampung Irrigation System

Sector :

Subsector:

Screening Questions		Score	Remarks ¹
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	1	Landslide
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	2	Topographical & geological condition
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	1	Heavy rain, floods
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): Medium risk

Other Comments: The Way Sekampung system has been established so long time with only minor risk to the performance of infrastructures,

The climate change will affect the productivity of paddy or other crops later in the far future

Prepared by: Kushartanto – Environment Specialist, Abidin Hadiarto - Irrigation Planning Design Specialist and Francois Kresno P - Assistant Hydraulic Modeling System.

¹ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

REA Checklist

IRRIGATION

Sekampung Batanghari Sub-system

Country/Project Title: Indonesia/Project Preparation Consultant Way Sekampung Irrigation System

Name of the respondents: Suyitno, WUAA

Name of the visited area:

- Village: Banjarsari
- Sub- district: Metro Utara
- District/City: Metro

Reminder:

- o The checklist is to be prepared to support the environmental classification of a project.
- o Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.
- o Carry a map of Protected Area.
- o Carry a camera.

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Protected Area		✓	Location of the project area is not adjacent to or within any of the following protected area. 1. Way Kambas National Park located in Lampung Timur District with a distance 38 km from project area. 2. Wan Abdul Rachman Grand Forest Park located in Pesawaran District with a distance 28 km from project area. 3. Gunung Balak Protected Forest located in Lampung Timur District with a distance 27 km from project area.
▪ Wetland		✓	Not within or adjacent to the Project area.
▪ Mangrove		✓	Not within or adjacent to the Project area. The coastal (mangrove) area is located more than 40 km from the Project area.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ Estuarine		✓	Not within or adjacent to the Project area. The coastal (estuarine) area is located more than 40 km from the Project area.
▪ Buffer zone of protected area		✓	Not within or adjacent to the buffer zone of protected area.
▪ Special area for protecting biodiversity.		✓	Based on the discussion with <i>Dinas Lingkungan Hidup</i> /Environmental Agency, Lampung Province, there is Liwa Botanical Garden (<i>Kebun Raya Liwa/KRL</i>), however it is located in Lampung Barat District with a distance 120 km from the Project area.
B. Potential Environmental Impacts Will the Project cause...			
▪ loss of precious ecological values (e.g. result of encroachment into forests/swamplands or historical/ cultural buildings/ areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)?		✓	Works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.
▪ conflicts in water supply rights related social conflicts?	✓		During the dry season the distribution of irrigation water is disrupted, due to the reduced amount of water supply to the irrigation area. When two farmers need water at the same time, this can lead to conflict, because they both want very limited water. Farmers should coordination with the water master (ili-ili) to regulate irrigation water flow as needed before use the water.
▪ impediments to movements of people and animals?	✓		Project rehabilitation consist of sediment excavation, defect canal lining demolition and precast/concrete canal lining installation. Temporary stockpiling of sediment and debris on the edge of the canals which adjacent to the public roads (before transported by dump trucks to the disposal site) will obstruct the traffic of people and animals. Debris/demolition wastes are needed by the local people to filled up earth roads, yard and others. Installs safety line (barricade) around the storage area, traffic signs and lighting and assign the flagmen to arrange traffic are required.
▪ potential ecological problems due to increased soil erosion and siltation, leading to decreased stream capacity?		✓	According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015 are classified into erosion level I (very light). The classification consists

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			of I (very light), II (light), III (moderate), IV (heavy) and V (very heavy). No ecological value in leading to decreased stream capacity.
▪ Insufficient drainage leading to salinity intrusion?	✓		Not applicable. Project area is located more than 40 km from coastal area.
▪ over pumping of groundwater, leading to salinization and ground subsidence?	✓		Not applicable. This project is surface water irrigation.
▪ impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water?	✓		There is no rehabilitation/modernization activity in the river body. Activity is carried out in the canal, both primary and secondary canals. The sequence of work is as follows: a) stoppage temporarily of irrigation water before carrying out the work. before carrying out the work. The Cropping Season adjusts to the work schedule, b) implementation of work to the completion, c) clean up the used material/remnants of work from the irrigation canals and d) irrigation water flow is opened.
▪ dislocation or involuntary resettlement of people?	✓		The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not dislocate any person, therefore no involuntary resettlement of people.
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?	✓		Lampung ethnic group consists of two indigenous groups, namely Lampung Saibatin and Lampung Pepadun. The area of Lampung Saibatin originally is located around the coast while the Pepadun is inland and hinterland, however that Indigenous People are not found surrounding the project area in Metro Utara Sub-district. No disproportionate impact on Indigenous Peoples or other vulnerable groups with considering that the works are confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site.
▪ potential social conflicts arising from land tenure and land use issues?	✓		The Project is confined to rehabilitation/modernization within the existing site for irrigation infrastructure and would not encroach into new site, therefore no potential

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																		
			<p>social conflicts arising from land tenure and land use issues.</p>																		
▪ soil erosion before compaction and lining of canals?	✓		<p>Soil erosion before compaction and lining of canals would be minimum.</p> <p>The sequence of work is as follows: a) stoppage temporarily of irrigation water before implementation of the work, b) demolition of existing canal lining and land clearing for earth secondary canals, c) compaction of canals, d) lining of canal is implemented after compaction of the canal is completed along 100 m, e) clean up the used material/remnants of work from the irrigation canals, and f) irrigation water flow is opened.</p>																		
▪ noise from construction equipment?	✓		<p>Heavy equipment noise emission levels and the quantity are tabulated below:</p> <table border="1"> <thead> <tr> <th>Equipment</th> <th>L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>Dump Truck</td> <td>84</td> <td>3</td> </tr> <tr> <td>Excavator</td> <td>85</td> <td>2</td> </tr> <tr> <td>Crane</td> <td>85</td> <td>8</td> </tr> <tr> <td>Generator</td> <td>82</td> <td>4</td> </tr> <tr> <td>Jackhammer*</td> <td>85</td> <td>6</td> </tr> </tbody> </table> <p>* There are 82 dBA @ 7 meter rated jackhammers (90 lb. class) available. This would be equivalent to 74 dBA @ 50 ft. These are silenced with molded intricate muffler tools.</p> <p>Source:</p> <ul style="list-style-type: none"> ○ Federal Highway Administration, U.S. Department of Transportation. ○ Draft Feasibility Study Report, July 2020. <p>Workers with a full-shift average exposure above 85 dBA are required to wear hearing protection devices (either earplugs or earmuffs).</p> <p>This hearing damage can result from repeated exposure to levels above 85 dBA (such as years of working around construction noise without hearing protection).</p> <p>Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, concrete truck mixer transportation), noise from construction activities</p>	Equipment	L max Noise (dBA) 50 ft., CA/T Project Spec. 721.560	Unit	Dump Truck	84	3	Excavator	85	2	Crane	85	8	Generator	82	4	Jackhammer*	85	6
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REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>(e.g., canal lining demolition and sediment removal) and noise from construction equipment and tools (e.g., dump truck, excavator, crane, jackhammer). Workers in the site are using tools such as: jackhammer, concrete mixer is the most people who are suffering from exposure to construction noise. Also, residents who are living beside the sites of construction works and those who are using the roads near to sites are suffering from the noise of construction.</p> <p>Impacts of noise on human: exposure to prolonged or excessive noise has been shown to cause a range of health problems ranging from stress, poor concentration, productivity losses in the workplace, and communication difficulties and fatigue from lack of sleep, to more serious issues such as cardiovascular disease, cognitive impairment and tinnitus.</p> <p>The preferred way to prevent hearing damage is to reduce noise at its source. However, earplugs and earmuffs will always be necessary for some construction activities.</p> <p>Impacts of noise on wildlife: human-induced noise pollution is one of many factors contributing to the depletion of wildlife populations. Laboratory studies and limited field research have uncovered four major ways in which animals are adversely affected by noise pollution: hearing loss, resulting from noise levels of 85 dBA or greater; masking, which is the inability to hear important environmental cues and animal signals; non-auditory physiological effects, such as increased heart rate and respiration and general stress reaction; and behavioural effects, which vary greatly between species and noise characteristics, resulting in, for example, abandonment of territory and lost reproduction. Studies on Rhesus Monkeys in the laboratory have shown that a 30% increase in blood pressure following exposure to as an average 85 dBA (lower at night, higher during the day) for eight months resulted in a permanently higher blood pressure and heart rate even after one month of quiet time! (Nature Sounds Society).</p> <p>Meanwhile, impacts of noise on plant: noise pollution is altering the landscape of plants and trees, which depend on noise-affected animals to pollinate them and spread their seeds. Some plants do worse in noisy areas, a study</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>found, while others seem to do better, depending on how the community of creatures around them changes.</p> <p>Activity at night time will be more cause nuisance to the surrounding environment.</p> <p>Impact of noise on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (27 km to 38 km) from the existing protected forest area, therefore, noise from construction activities does not cause negative impacts against animals and plants in the national park, grand forest park, and protected forest areas.</p>
▪ dust during construction?	✓		<p>Dust because of vehicles: vehicles entrance and exist to the site is very important task, which generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site, this means that not only the labours will harm, but also the public.</p> <p>Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal/excavation.</p> <p>There are some people exposing and breathing dust every day regardless they are labours, residents, or those who are using roads near to construction sites.</p> <p>Dust pollution is the introduction of particulate matter that cause harm or discomfort to humans or other living organisms, or cause damage to the natural environment.</p> <p>Impacts of dust on human: in fact, dust when inhaled can increase breathing problems, damage lung tissue, and aggravate existing health problems. In addition to health concerns, dust generated from various activities can reduce visibility, resulting in accidents (Division of Genetics and Plant Propagation, India) and impacts of dust on plant: the rate of photosynthesis will decrease if the stomata on the surface of leaves be covered with</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>dust. Therefore, if stomatal pores will be covered, then there will be decline in the process of photosynthesis and ultimately the plant will die due to absence of nutrients.</p> <p>Meanwhile, impacts of dust on animals: according to the American Society for the Prevention of Cruelty to Animals (ASPCA), when allergy season hits, dust may affect the health of the pets with suffer the nagging symptom, such as a runny nose, itchy eyes and dry skin.</p> <p>Impact of dust on animal and plant in surroundings project area would be minimum, however, distance of the project area is far (27 km to 38 km) from the existing protected forest area, therefore, dust from construction activities does not cause negative impacts against animals and plants in the national park, grand forest park, and protected forest areas.</p> <p>The mitigation measures to minimize the impact, such as (i) regular watering to exposed lands by water tank which the water is taken from the nearest river; (ii) cover the tailgate with tarpaulin or plastic sheet during transporting dispersible materials to and from the site to prevent debris scattered and dust spreads to area surrounding transportation corridor traverses; (iii) the dust content due to demolition of canal lining is minimized by watering the site through water tank which the water is taken from the nearest river ; (iv) and agreement with the local community on the schedule and duration of construction works, (iv) construction workers should wear standard PPE (dust masker).</p>
▪ waterlogging and soil salinization due to inadequate drainage and farm management?	✓		<p>Extraction of materials can disrupt natural land contours and vegetation, resulting in accelerated erosion, disturbance in natural drainage patterns and waterlogging.</p> <p>So far, waterlogging in irrigation area due to reduced drainage capacity has never occurred, because excavation of sediment in the canal is always done periodically. Sediment removal plan annually by machinery in main canal is 3,360 m³, meanwhile sediment removal by man power 1 m depth in secondary canal is 228 m³ (Draft Feasibility Study Report, July 2020).</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks																									
▪ leaching of soil nutrients and changes in soil characteristics due to excessive application of irrigation water?	✓		Farmers saving irrigation water, do not inundate land when planting paddy (transplanting), there is no swift flow of water that transport soil nutrient out of paddy fields.																									
▪ reduction of downstream water supply during peak seasons?	✓		<p>Reduction of downstream water supply occurred during dry seasons, which the required discharge is insufficient to irrigate the entire irrigation area, so that most of the discharge is flowed into the irrigation area. In this condition, water supply to downstream of the Argoguruh weir is limited.</p> <p>However, the case did not continue until the conflict.</p>																									
▪ soil pollution, polluted farm runoff and groundwater, and public health risks due to excessive application of fertilizers and pesticides?	✓		<p>No excessive application of fertilizers and pesticides. Integrated Crop Management (ICM) and Integrated Pest Management (IPM) have been applied by most farmers to use fertilizer according to the need and promote on using organic fertilizer.</p> <p>Application of ICM and IPM in the field will follow the instruction of PPL (<i>Penyuluhan Pertanian Lapangan</i>/ Field Extension Worker). PPL conducts an extension to the farmers every 2 to 3 weeks.</p> <p>Water quality of Way Sekampung River in downstream area in some locations related to application of fertilizers in Way Sekampung Irrigation System, as follows:</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Apr 2009</th> <th>May 2009</th> <th>Jun 2009</th> <th>Water Quality Standard Class IV</th> </tr> </thead> <tbody> <tr> <td>Nitrate Nitrogen (NO₃ - N)</td> <td>1.5678</td> <td>0.9716</td> <td>0.6629</td> <td><20 mg/L</td> </tr> <tr> <td>Nitrite Nitrogen (NO₂ - N)</td> <td>0.1662</td> <td>0.1682</td> <td>0.0131</td> <td>-</td> </tr> <tr> <td>Ammonia (NH₃ - N)</td> <td>0.8113</td> <td>0.5818</td> <td>0.5239</td> <td>-</td> </tr> <tr> <td>Phosphate</td> <td>0.1161</td> <td>0.1467</td> <td>0.2188</td> <td>5</td> </tr> </tbody> </table> <p>Source: BPLHD, Regional Environmental Status Data Book, Lampung Province, 2009</p> <p>Measurement in Gunung Raya Village, Sekampung Udik Sub district, East Lampung District.</p>	Parameter	Apr 2009	May 2009	Jun 2009	Water Quality Standard Class IV	Nitrate Nitrogen (NO ₃ - N)	1.5678	0.9716	0.6629	<20 mg/L	Nitrite Nitrogen (NO ₂ - N)	0.1662	0.1682	0.0131	-	Ammonia (NH ₃ - N)	0.8113	0.5818	0.5239	-	Phosphate	0.1161	0.1467	0.2188	5
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REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks				
			Parameter	Apr 2009	May 2009	Jun 2009	Water Quality Standard Class IV
			mg/L				
			Nitrate Nitrogen (NO ₃ - N)	1.115	1.2169	0.4887	<20
			Nitrite Nitrogen (NO ₂ - N)	0.1319	0.1319	0.0124	-
			Ammonia (NH ₃ - N)	0.6432	0.2756	0.3206	-
▪ soil erosion (furrow, surface)?		✓	Source: BPLHD, Regional Environmental Status Data Book, Lampung Province, 2009 Measurement in Margo Toto Village, Metro Kibang Sub District, South Lampung District.				
According to the contents of Nitrate Nitrogen, Nitrite Nitrogen, Ammonia and Phosphate showed still far below the standard.							
▪ scouring canals?		✓	According to Erosion Intensity Maps of Upstream Catchment Area scale 1: 300,000 and Way Sekampung Irrigation System scale 1: 200,000, 2015, the Project area is classified into erosion level I (very light). The classification: I (very light), II (light), III (moderate), IV (heavy) and V (very heavy).				
▪ clogging of canals by sediments?		✓	No scouring canals. Canal slope with concrete lining along the feeder canals and primary canals, meanwhile canals slope and canal bed with concrete lining along the secondary canals. The canal gradient 0.0003 and flow velocity 0.5 m/sec to 1.4 m/sec appropriate with the design standards (Draft Feasibility Study Report, July 2020).				
▪ clogging of canals by weeds?		✓	Sedimentation occurs at the ends of primary and secondary canals, because water flow slows down and even stops when the water gates are clogged by sediment / rubbish. Coordination with the water master (Ili-ili) or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.				

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			Coordination with the water master or water user association to remove sediment manually soon to flow irrigation water into their paddy fields.
▪ seawater intrusion into downstream freshwater systems?	✓		Not applicable. Irrigation area not located in coastal area.
▪ introduction of increase in incidence of waterborne or water related diseases?		✓	<p>Information collected from Public Health Centre related is a matter of household sanitation, clean water sources, Public Health Centre programs, and free defecation programs conducted with village offices and the top 10 diseases in one year based on the number of patient visits. Water-borne diseases that enter the top ten are dominated by diarrhoea and dermatitis. At the top, it is dominated by airborne diseases such as upper respiratory tract infection. However, non-infectious diseases have started to move up in the top ten.</p> <p>A pre-formulated questionnaire was used to interview respondents containing questions about personal data, characteristics of farmers, duration of contact with irrigation water, use of pesticides and fertilizers, use of personal protective equipment, availability of clean water and household sanitation. The survey was conducted in a sample of 31 villages and 210 farmer interviews which form the sample for assessing community health in the Way Sekampung Irrigation System.</p> <p>Waterborne diseases occur due to poor hygiene, household sanitation and bad quality of clean water sources. These diseases can be transmitted by waterborne, such as diarrhoea, dysentery, cholera, polio, typhoid, hepatitis, meningitis. Interviewing farmers indicated low levels of waterborne diseases within the Way Sekampung Irrigation System. It is noted that one farmer was infected with dengue fever, one person suffered diarrhoea, and one person had typhoid and 8 person's dermatitis. In total, this amounts to only 5% of the sample. Other infectious diseases that occur anecdotal are cough, flu, and fever. The amount is 2% of the sample. Non-infectious diseases reported are rheumatic pain, headache, and gastritis, for 6% of the sample. Non-infectious diseases have been shifting to the top ten diseases in Way Sekampung Irrigation System.</p> <p>(Draft Feasibility Study Report, Supplement I Public Health Report, July 2020).</p>

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
▪ dangers to a safe and healthy working environment due to physical, chemical and biological hazards during project construction and operation?	✓		<p>No chemical and biological materials used during project construction and operation.</p> <p>Dangers to a safe and healthy working environment due to hazards during project construction, such as:</p> <ul style="list-style-type: none">- Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the workers.- Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dusts out the site will harm the labours.- Dust because of construction activities: the majority of construction activities causes an effect on the environment and generates amount of dust. These activities such as canal lining demolition and sediment removal.- There are some people exposing and breathing dust every day regardless they are labours of construction work.- Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction tools (e.g., jackhammer). Workers in the site are using equipment and tools such as: dump truck, excavator, crane, jackhammer and concrete mixer are the most people who are suffering from exposure to construction noise.- Workers in the site are using jackhammer are suffering from exposure to construction vibration.- Installation of precast canal lining in primary canal by the crane. The movement of workers in the canal (right and left sides) by passing the ladder placed on the slope of the canal. Average height of primary canals is 6.0 m. Placement of the ladder on unstable site may cause the ladder to collapse and worker to fall.

REA Checklist

IRRIGATION

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			<ul style="list-style-type: none"> - Meanwhile, the installation of concrete canal lining in the secondary canal by a Concrete Truck Mixer. Movement of workers in the canal (right and left sides) by crossing temporary pedestrian bridge placed on both sides of the canal. Average height of secondary canals is 2.5 m. Placement of the bridge at a fragile location, not strong bridge material and the absence of a hand rail may cause to collapse of the bridge and the fall of passing workers. - Workers should wear standard PPE (helmet, gloves /vibration-damping gloves, safety boots, ear protection and face protection). <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area.</p> <p>Some locations will be occupied for Base camp, warehouse, fuel tank and heavy equipment parking for project rehabilitation.</p> <p>Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response plan and evacuation route should be provided.</p>
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?	✓		<p>Total workforce during project rehabilitation is 144 persons, which around 75% of the total workforce as unskilled labourers employed from surrounding residents and they will live in their respective homes, therefore there are not any a large population influx. Recruits local labour profusely.</p> <p>No special base camp for rehabilitation workers. They will stay in some rental houses as the base camp located in surrounding project area. This condition not likely to causes increased burden on social infrastructure and services (such as water supply and sanitation systems).</p>
▪ social conflicts if workers from other regions or countries are hired?	✓		<p>Many unskilled workers, bricklayer, drivers and securities are available for project construction in surrounding project area.</p> <p>Priority for local workers.</p>
▪ risks to community health and safety due to the transport, storage, and use and/or disposal	✓		<p>There is no transport, storage, and use and/or disposal of materials such as explosives and other chemicals during construction and operation.</p>

REA Checklist

IRRIGATION

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of materials such as explosives, fuel and other chemicals during construction and operation?			<p>Risks to community health and safety due to the transport, storage, and use and/or disposal of materials during construction, such as:</p> <ul style="list-style-type: none">- Dust because of vehicles: vehicles entrance and exist to the site may generate amount of dust. Transport materials to site of work and transport demolition waste to disposal sites cause amount of dust. Also, vehicles wheels contain amount of suspended materials such as dust, sand and clay. These dusts are suspended with air, soil and water. Furthermore, vehicles transport this dust out the site will harm the public.- Dust because of construction activities: the majority of construction activities causes an effect on the environment, due to generates amount of dust. Project location is adjacent to residential area. These activities such as canal lining demolition and sediment removal/excavation.- There are some people exposing and breathing dust every day regardless they are residents, or those who are using roads near to construction sites.- Noise from vehicles movement (e.g., material, sediment and demolition waste transportation, Concrete Truck Mixer transportation), noise from construction activities (e.g., canal lining demolition and sediment removal/excavation) and noise from construction equipment and tools (e.g., dump truck, excavator, crane, jackhammer). Residents who are living beside the sites of construction works and those who are using the roads near to sites are suffering from the noise of construction.- Vehicles transporting material, sediment and waste canal lining demolition in and out the site may induce traffic accidents toward the residents, which staying in the transportation corridor traverses by construction vehicles.- No hazardous waste. No painting work. Painting irrigation gates and other structures is undertaken by fabrication.- Handling oil spills from vehicle, etc. with the following steps:<ul style="list-style-type: none">o Sprinkle sawdust or coconut husks,o Allow the absorbent material to work on the oil for 24 to 48 hours,

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ Repeat with fresh absorbent material as needed to remove any remaining oil.- Fire and fuel leakage may happen on storage of fuel in the base camp. Safety sign board and second containment should be installed and appropriate First Aid box and fire extinguisher, Emergency response and evacuation route should be provided. <p>The Covid-19 prevention procedures for workers and community surrounding the project:</p> <ol style="list-style-type: none">1. Administrative Controls <p>Use administrative controls, when feasible, to reduce or eliminate the risk of exposure, such as training for construction workers on the spread of the disease in the geographic areas in which they work.</p> <ul style="list-style-type: none">▪ The signs and symptoms of Covid-19 and an explanation of how the disease is potentially spread, including the fact that infected people can spread the virus even if they do not have symptoms.▪ All policies and procedures that are applicable to the employee's duties as they relate to potential exposures to Covid-19. It is helpful to provide employees with a written copy of those standard operating procedures.▪ Information on appropriate social distancing and hygiene practices, including:<ul style="list-style-type: none">○ Avoiding physical contact with others and maintaining a distance of at least 6 feet (~ 2 m) from customers and other individuals, whenever possible, including inside work trailers.○ Appropriate cleaning practices (i.e., washing hands frequently with soap and water for at least 20 seconds, or, if soap and water are not immediately available, using alcohol-based hand sanitizer that contains at least 60% alcohol and rubbing hands until they are dry; sanitizing all surfaces workers will touch).○ The proper way to cover coughs and sneezes (i.e., sneezing or coughing into a tissue or into the upper sleeve).○ Alternatives to shaking hands upon entry, and the importance of workers not touching their own faces (mouth, nose, eyes).

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<ul style="list-style-type: none">○ The benefits of driving to work sites or parking areas individually, when possible, without passengers or carpools.▪ The types, proper use, limitations, location, handling, decontamination, removal, and disposal of any PPE being used.▪ The importance of staying home if they are sick.▪ Wearing masks over their noses and mouths to prevent them from spreading the virus.▪ The need to continue using other normal control measures, including PPE, necessary to protect workers from other job hazards associated with construction activities.▪ Using cleaning chemicals that have label claims against the coronavirus for cleaning frequently touched surfaces like tools, handles, and machines.▪ The need to report any safety and health concerns. <p>2. Safe Work Practices</p> <ul style="list-style-type: none">▪ To the extent possible, screen all visitors including community surrounding the project on all construction sites in advance of their arrival on the job site for signs and symptoms of Covid-19.▪ Adopt staggered work schedules, e.g., provide alternating workdays or extra shifts, to reduce the total number of employees on a job site at any given time and to ensure physical distancing.▪ Identify choke points where workers are forced to stand together, such as hallways, hoists and elevators, ingress and egress points, break areas, and buses, and implement policies to maintain social distancing.▪ Institute a rigorous housekeeping program to reduce dust levels on the job site.▪ Keep in-person meetings (including toolbox talks and safety meetings) as short as possible, limit the number of workers in attendance, and use social distancing practices.▪ Ensure clean toilet and handwashing facilities. Clean and disinfect portable job site toilets regularly. Fill hand sanitizer dispensers regularly. Disinfect frequently touched items (i.e., door pulls and toilet seats) regularly.

REA Checklist

IRRIGATION

Screening Questions	Yes	No	Remarks
			<p>Source: Covid-19 Control and Prevention/ Construction Work, OSHA, United States Department of Labor.</p> <p>Watering on the road that is passed by dump trucks in a residential area periodically and limits the vehicle speed does not exceed 40 km / h when passing the area.</p> <p>Assign the flagman on roads which are often jammed by project vehicles</p> <p>Mitigation measures: Management System on Community Health and Safety should be applied and monitored during construction and operation.</p> <p>Wearing standard Personal Protection Equipment (PPE).</p>
<ul style="list-style-type: none">▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	✓		<p>Argoguruh weir is not accessible to members of the affected community throughout project construction, operation and decommissioning. There is no rehabilitation work at Argoguruh weir and around the weir is fenced and padlocked. Based on the explanation in remarks above then it is should be no community safety risks due to both accidental and natural hazards.</p>

REA Checklist

IRRIGATION

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: Indonesia/Project Preparation Consultant Way Sekampung Irrigation System

Sector :

Subsector:

Screening Questions		Score	Remarks¹
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	1	Landslide
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	2	Topographical & geological condition
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	1	Heavy rain, floods
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High): Medium risk

Other Comments: The Way Sekampung system has been established so long time with only minor risk to the performance of infrastructures,

The climate change will affect the productivity of paddy or other crops later in the far future

Prepared by: Kushartanto – Environment Specialist, Abidin Hadiarto - Irrigation Planning Design Specialist and Francois Kresno P - Assistant Hydraulic Modeling System.

¹ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.



KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL SUMBER DAYA AIR
DIREKTORAT IRIGASI DAN RAWA
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**Kerangka Acuan Kerja (KAK) Dokumen Evaluasi Lingkungan Hidup
(DELH) dan Initial Environmental Examination (IEE)**

**Kegiatan Sistem Irigasi Way Sekampung
Lampung, Sumatera**

September 2020

KPP Pengembangan Sistem Irigasi Way Sekampung

Jakarta

Daftar Isi

1.	Pendahuluan	1
a.	Latar Belakang.....	1
b.	Kategorisasi Dokumen Lingkungan	1
c.	Penilaian Dokumen Lingkungan	2
2.	Deskripsi Rencana Kegiatan	3
a.	Tujuan Rencana Kegiatan.....	3
b.	Deskripsi Rencana Kegiatan.....	3
3.	Tujuan dan Fungsi KAK.....	5
a.	Tujuan KAK.....	5
b.	Fungsi KAK.....	6
4.	Tujuan dan Lingkup Analisis	6
a.	Tujuan Analisis	6
b.	Lingkup Analisis	6
5.	Batas Wilayah Analisis.....	6
a.	Batas Proyek.....	6
b.	Batas Ekologi.....	6
c.	Batas Sosial.....	7
d.	Batas Administrasi	7
e.	Batas Wilayah Analisis.....	8
6.	Isu-isu Lingkungan dan K3 yang harus dianalisis	8
a.	Penentuan Lokasi Proyek (Audit)	8
b.	Tahap Rehabilitasi/Konstruksi.....	9
c.	Tahap Operasi & Pemeliharaan (Audit).....	9
7.	Metodologi.....	10
a.	Metode Pengumpulan Data.....	10
b.	Metode Analisis Data.....	14
c.	Metode Evaluasi.....	17
d.	Metode Pengelolaan Lingkungan Hidup	18
e.	Metode Pelatihan	18

8.	Tenaga Ahli yang Dibutuhkan	19
a.	Persyaratan Tenaga Ahli	19
b.	Uraian Tugas Tenaga Ahli.....	19
c.	Uraian Tugas Asisten Tenaga Ahli dan Tenaga Pendukung.....	22
9.	Waktu Pelaksanaan dan Keluaran Analisis.....	24
a.	Waktu Pelaksanaan Analisis.....	24
b.	Keluaran Analisis.....	24
10.	Sistematika Laporan.....	26
a.	DELH.....	26
b.	IEE	26
c.	Laporan Pelatihan.....	26
11.	Pekerjaan Sub-konsultan.....	31
a.	Persyaratan Perusahaan Sub-konsultan.....	31
b.	Persyaratan Laboratorium	31

Daftar Tabel

Tabel 1- Tipe, Tinggi Dan Lebar Bendung Argoguruh.....	3
Tabel 2 - Pengadaan Tanah Bangunan Rumah Genset.....	3
Tabel 3 - Sub-Daerah Irigasi, Debit, Luas layanan, dan Saluran Rusak.....	4
Tabel 4 - Panjang Pemasangan Beton Pracetak	4
Tabel 5 - Panjang Saluran dan Volume Sedimen	5
Tabel 6 - Lokasi Administrasi Kecamatan dan Kabupaten.....	7
Tabel 7 - Keahlian yang Dibutuhkan	19
Tabel 8 - Jenis Dokumen yang harus diserahkan.....	25
Tabel 9 - Keterkaitan Isu-Isu Lingkungan dan K3 dengan Tugas Tenaga Ahli	27

1. Pendahuluan

a. Latar Belakang

Pertanian merupakan sektor penting dalam pembangunan perekonomian, mengingat fungsi dan perannya dalam penyediaan pangan bagi penduduk, pakan dan energi, serta tempat bergantungnya mata pencaharian penduduk di pedesaan. Sektor pertanian mempunyai sumbangan yang berarti dalam pembentukan Produk Domestik Bruto (PDB), peningkatan devisa dan peningkatan kesejahteraan petani, sehingga pembangunan pertanian dapat dikatakan sebagai motor penggerak dan penyanga perekonomian nasional.

Dalam rangka mendukung Program Kartu Petani Berjaya yang dicanangkan Gubernur Lampung dan akan dilaksanakannya kegiatan Pengembangan Sistem Irigasi Way Sekampung dengan sumber dana Loan ADB No. 3455-INO tahun 2019 pada Balai Besar Wilayah Sungai Mesuji Sekampung, di mana sebagai salah satu syarat dalam pelaksanaannya diperlukan dokumen lingkungan.

Sistem Irigasi Way Sekampung telah dikembangkan sejak tahun 1935 oleh Direktorat Jenderal Sumber Daya Air, Kementerian PUPR. Berdasarkan hasil SID tahun 2019-2020 oleh Egis EAU bekerja sama dengan PT. Kwarsa Hexagon, PT. Tata Guna Patria dan PT. Perancang Adhinusa pemanfaatan lahan saat ini berupa lahan sawah sebesar 55.373 ha. Dalam upaya peningkatan produksi tanaman pangan, maka pemerintah melalui BBWSMS akan melakukan kegiatan Pengembangan Sistem Irigasi Way Sekampung.

Pengelolaan air irigasi dari hulu sampai dengan hilir memerlukan sarana dan prasarana irigasi yang memadai. Sarana dan prasarana tersebut dapat berupa: bendung, saluran primer, saluran sekunder, bangunan bagi, bangunan sadap, bangunan ukur, dan saluran tersier serta saluran tingkat usaha tani. Tidak berfungsinya atau rusaknya salah satu bangunan irigasi akan mempengaruhi kinerja sistem irigasi yang ada, sehingga mengakibatkan efisiensi dan efektifitas irigasi menurun.

b. Kategorisasi Dokumen Lingkungan

Pembangunan Bendung Argoguruh dan Daerah Irigasi Way Sekampung diselesaikan pada tahun 1935, sedangkan peraturan tentang lingkungan di Indonesia, yaitu Undang- Undang Nomor 4 Tahun 1982 tentang Ketetentuan-Ketentuan Pokok Pengelolaan Lingkungan diundangkan pada 11 Maret 1982. Hal ini yang menjadi alasan mengapa sampai sekarang pihak Pemrakarsa belum memiliki Amdal atau dokumen lingkungan sejenis serta Izin Lingkungan.

Berdasarkan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor: P.102/MENLHK/SETJEN/KUM.1/12/2016 tentang Pedoman Penyusunan Dokumen Lingkungan Hidup Bagi Usaha/Kegiatan yang Telah Memiliki Izin Usaha dan/atau Kegiatan tetapi Belum Memiliki Dokumen Lingkungan Hidup, maka menurut Pasal 3, ayat (1) Dokumen Evaluasi Lingkungan Hidup (DELH) atau Dokumen Pengelolaan Lingkungan Hidup (DPLH) wajib disusun oleh penanggung jawab usaha dan/atau kegiatan terhadap usaha dan/atau kegiatan yang memenuhi kriteria:

- 1) telah memiliki legalitas pelaksanaan kegiatan;
- 2) telah melaksanakan kegiatan;
- 3) lokasi kegiatan sesuai dengan rencana tata ruang;
- 4) tidak memiliki dokumen lingkungan hidup atau memiliki dokumen lingkungan hidup tetapi dokumen lingkungan hidup tidak sesuai dengan ketentuan peraturan perundang-undangan.

Kategorisasi mengacu Peraturan Menteri Lingkungan Hidup dan Kehutanan Republik Indonesia Nomor: P.38/MENLHK/SETJEN/KUM.1/7/2019 tentang Jenis Rencana Usaha dan/atau Kegiatan yang Wajib Memiliki Analisis Mengenai Dampak Lingkungan Hidup, menunjukkan bahwa pembangunan jaringan irigasi dengan luasan (Skala/Besaran) ≥ 3.000 ha termasuk di dalam daftar jenis rencana usaha dan/atau kegiatan yang wajib memiliki analisis mengenai dampak lingkungan hidup (AMDAL) bidang Pekerjaan Umum.

Dengan pertimbangan bahwa tahap kegiatan rehabilitasi Sistem Irigasi Way Sekampung di sebagian lokasi adalah rehabilitasi (konstruksi) dan di sebagian lokasi lainnya pada tahap operasi atau sedang/sudah berjalan, maka dokumen lingkungan yang wajib dimiliki adalah Dokumen Evaluasi Lingkungan Hidup (DELH). Kategorisasi tersebut diperkuat oleh Dinas Lingkungan Hidup Provinsi Lampung melalui surat nomor: 660/150/V.10/2020 tertanggal 18 Agustus 2020 perihal Arahan Penyusunan Dokumen Lingkungan Hidup.

Tahap Kegiatan			
Pra Konstruksi	Konstruksi	Operasi	Pasca-Operasi
Belum Berjalan			Sedang/Sudah Berjalan
UKL-UPL			DPLH
AMDAL			DELH

Kategorisasi sesuai dengan hasil Rapid Environmental Assessment (REA)/Kajian Lingkungan Cepat dan arahan Tim Environmental and Social Safeguards (Perlindungan Lingkungan dan Sosial) ADB pada 14 September 2020, proyek kegiatan pengembangan Sistem Irigasi Way Sekampung diklasifikasikan sebagai Kategori B, karena potensi dampak lingkungan negatif yang akan ditimbulkan lebih kecil dibandingkan dengan proyek Kategori A, oleh karena itu, jenis dokumen lingkungan yang harus dimiliki adalah IEE (Initial Environmental Examination).

c. Penilaian Dokumen Lingkungan

Menurut Peraturan Menteri Lingkungan Hidup Republik Indonesia Nomor 08 Tahun 2013 tentang Tata Laksana Penilaian dan Pemeriksaan Dokumen Lingkungan Hidup serta Penerbitan Izin Lingkungan Pasal 10, ayat (2) Komisi Penilai Amdal (KPA) provinsi berwenang menilai KA, Andal, dan RKL-RPL bagi jenis rencana usaha dan/atau kegiatan yang: a. bersifat strategis; dan/atau b. sebagaimana tercantum dalam Lampiran IV dan Lampiran V Peraturan Menteri ini apabila berlokasi di: 1. lebih dari satu wilayah kabupaten/kota; 2. lintas kabupaten/kota; dan/atau 3. wilayah laut paling jauh 12 (duabelas) mil dari garis pantai ke arah laut lepas dan/atau ke arah perairan kepulauan.

Bendung Argoguruh dan Sistem Irigasi Way Sekampung berada di 4 Kabupaten/Kota yang meliputi Kabupaten Pesawaran, Kota Metro, Kabupaten Lampung Tengah, dan Kabupaten Lampung Timur, Provinsi Lampung. Oleh karena itu, KPA DELH adalah Dinas Lingkungan Hidup Provinsi Lampung.

Sedangkan penilaian dokumen IEE akan dilakukan oleh Environmental and Social Safeguards (Perlindungan Lingkungan dan Sosial) ADB.

2. Deskripsi Rencana Kegiatan

a. Tujuan Rencana Kegiatan

Tujuan rencana kegiatan pengembangan Sistem Irigasi Way Sekampung adalah untuk melakukan rehabilitasi dan modernisasi infrastruktur jaringan irigasi. Rehabilitasi infrastruktur jaringan irigasi merupakan kegiatan perbaikan kerusakan-kerusakan jaringan irigasi, yang meliputi saluran primer, saluran sekunder, bangunan-bangunan irigasi dan pengeringan sedimen, sedangkan modernisasi infrastruktur jaringan irigasi adalah otomatisasi pintu-pintu bangunan irigasi dengan menggunakan sistem kontrol otomatisasi (Scada) guna meningkatkan fungsi dan pelayanan irigasi, sehingga meningkatkan intensitas pertanaman (IP). Hasil kegiatan ini diharapkan dapat meningkatkan pendapatan para petani yang berada di Sistem Irigasi Way Sekampung melalui peningkatan IP dari 183 % menjadi 203 %.

b. Deskripsi Rencana Kegiatan

Deskripsi rencana kegiatan pengembangan sistem irigasi Way Sekampung, sebagaimana diuraikan di bawah ini.

- 1) Tipe, Tinggi dan Lebar Bendung Argoguruh, sebagaimana disebutkan di tabel di bawah ini.

Tabel 1- Tipe, Tinggi Dan Lebar Bendung Argoguruh

Tipe	Tinggi (m)	Lebar (m)
Pasangan Batu	7	131

Sumber: Survey Lapangan Pengembangan Sistem Irigasi Way Sekampung, ESP, KPP, Kementerian PUPR, September 2019.

- 2) Pengadaan Tanah

Pengadaan tanah yang digunakan untuk bangunan rumah generator set (genset) masing-masing seluas antara 16 m² dan 25 m². Lokasi bangunan-bangunan rumah genset tersebut berada di tanah Kementerian PUPR dan di tanah masyarakat.

Tabel 2 – Pengadaan Tanah Bangunan Rumah Genset

No.	Sub-Daerah Irigasi	Lokasi Rumah Genset (Bangunan)		
		Tanah PUPR	Tanah Masyarakat	Total
1	Bekri	1	2	3
2	Punggur Utara	11	8	19
3	Raman Utara	4	0	4
4	Sekampung Batanghari	0	3	3
5	Sekampung Bunut	1	0	1
6	Rumbia Barat	3	3	6
7	Batanghari Utara	0	1	1
Total		20	17	37

Sumber : Laporan Studi Kelayakan Pengembangan Sistem Irigasi Way Sekampung, ESP, KPP, Kementerian PUPR, Juli 2020.

- 3) Sub-Daerah Irigasi, Debit, Luas layanan, Saluran-saluran Primer dan Sekunder, Bangunan Bagi, Bangunan Sadap dan Saluran-saluran Primer dan Sekunder Rusak untuk Direhabilitasi, sebagaimana disebutkan di tabel di bawah ini.

Tabel 3 - Sub-Daerah Irigasi, Debit, Luas layanan, dan Saluran Rusak

No.	Sub-Daerah Irigasi	Debit (l/det)	Luas Layanan (ha)	Panjang Saluran	Panjang Saluran	Saluran Sekun-	Bangun-	Panjang Saluran Rusak (m)		
				Primer (km)	Sekun- der (km)	der (Jumlah)	an Bagi (Jumlah)	Bangun- an Sadap (Jumlah)	Saluran Primer	Saluran Sekun- der
1	Bekri	9.402	5.000	16	98	8	23	230	2.648	578
2	Punggur Utara	20.013	21.181	38	206	21	49	457	1.293	49.928
3	Raman Utara	11.942	4.721	28	22	7	8	100	17.090	7.624
4	Sekampung Batanghari	14.481	9.634	42	53	8	24	193	6.905	17.822
5	Sekampung Bunut	5.263	5.515	48	38	4	14	125	520	2.077
6	Rumbia Barat	9.798	5.106	21	59	8	16	129	116	5
7	Batanghari Utara	5.732	4.216	32	28	6	8	97	13.324	10.348
	Total	76.631	55.373	226	504	62	142	1.331	41.896	88.382

Sumber: Laporan Rencana Induk Pengembangan Sistem Irigasi Way Sekampung, ESP, KPP, Kementerian PUPR, Januari 2020.

- 4) Pemasangan Beton Pracetak Saluran

Panjang pemasangan beton pracetak baru pada saluran sekunder tanah, sebagaimana disebutkan pada tabel di bawah ini.

Tabel 4 - Panjang Pemasangan Beton Pracetak

No.	Sub-Daerah Irigasi	Panjang Pemasangan Beton Pracetak (m)
1	Bekri	1.500
2	Punggur Utara	50.000
3	Raman Utara	12.500
4	Sekampung Batanghari	5.200
5	Sekampung Bunut	1.700
6	Rumbia Barat	0
7	Batanghari Utara	4.100
	Total	75.000

Sumber : Laporan Studi Kelayakan Pengembangan Sistem Irigasi Way Sekampung, ESP, KPP, Kementerian PUPR, Juli 2020.

5) Pengerukan Sedimen

Panjang pengerukan saluran primer dan sekunder dan volume sedimen, sebagaimana disebutkan di bawah ini.

Tabel 5 - Panjang Saluran dan Volume Sedimen

No.	Sub-Daerah Irigasi	Panjang Pengerukan Saluran Primer dan Sekunder (m)	Volume Sedimen (m ³)
1	Bekri	89.600	21.500
2	Punggur Utara	47.700	38.000
3	Raman Utara	0	0
4	Sekampung Batanghari	276	1.000
5	Sekampung Bunut	700	100
6	Rumbia Barat	17.000	33.000
7	Batanghari Utara	753	1.000
	Total	156.029	94.600

Sumber : Laporan Studi Kelayakan Pengembangan Sistem Irigasi Way Sekampung, ESP, KPP, Kementerian PUPR, Juli 2020.

- 6) Selama pelaksanaan pengerukan sedimen dan rehabilitasi saluran primer dan sekunder dan bangunan-bangunan serta pintu-pintu irigasi, aliran air irigasi akan dihentikan sementara. Pelaksanaan Musim Tanam (MT) untuk penanaman padi akan menyesuaikan dengan pekerjaan-pekerjaan tersebut di atas. Sebelum pelaksanaan pekerjaan rehabilitasi/konstruksi saluran irigasi dan pengerukan sedimen tersebut akan dilakukan sosialisasi terlebih dahulu tentang maksud dan tujuan dan jadwal pelaksanaan pekerjaan-pekerjaan fisik tersebut untuk mendapatkan kesepakatan antara Dinas PSDA Wilayah II Metro dan Perkumpulan Petani Pemakai Air (P3A). Hasil kesepakatan akan dinyatakan dalam Berita Acara Kesepakatan yang ditandatangi oleh perwakilan Dinas PSDA Wilayah II Metro dan P3A.
- 7) Puing pembongkaran lapisan saluran dan sedimen pengerukan saluran akan dibuang di tempat pembuangan (*disposal area*) yang berjarak antara 1 km dan 3 km dari tapak proyek.
- 8) Pemasangan beton pracetak dilakukan setelah lapisan saluran selesai dibongkar setiap 100 m. Tahapan ini untuk meminimalisasi terjadinya erosi tanah sebelum pematangan dan pelapisan saluran dengan beton pracetak.

3. Tujuan dan Fungsi KAK

a. Tujuan KAK

- 1) merumuskan lingkup dan kedalaman DELH dan IEE;
- 2) mengarahkan kajian DELH dan IEE agar berjalan secara efektif dan efisien sesuai dengan dana, tenaga, dan waktu yang tersedia.

b. Fungsi KAK

- 1) sebagai rujukan penting bagi pemrakarsa, Balai Besar Wilayah Sungai Mesuji Sekampung, Direktorat Irigasi dan Rawa, Direktorat Jenderal Sumber Daya Air, Kementerian Pekerjaan Umum dan Perumahan Rakyat, Perusahaan Konsultan Penyiapan Proyek (KPP) Pengembangan Sistem Irigasi Way Sekampung, penyusun DELH dan IEE, dan Dinas Lingkungan Hidup Provinsi Lampung serta Divisi Lingkungan Hidup ADB tentang lingkup dan kedalaman DELH dan IEE yang akan dilakukan,
- 2) sebagai salah satu bahan rujukan bagi penilai dokumen DELH dan IEE untuk mengevaluasi hasil kajian/analisis DELH dan IEE.

4. Tujuan dan Lingkup Analisis

a. Tujuan Analisis

Tujuan pekerjaan ini adalah menyusun Dokumen Evaluasi Lingkungan Hidup (DELH) dan *Initial Environmental Examination* (IEE) serta melakukan pelatihan pengelolaan lingkungan hidup.

b. Lingkup Analisis

Lingkup pekerjaan ini meliputi survai pengumpulan dan analisis data primer dan data sekunder, evaluasi dan penyusunan DELH dan IEE, masing-masing sesuai dengan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor: P.102/MENLHK/ SETJEN/KUM.1/12/2016 tentang Pedoman Penyusunan Dokumen Lingkungan Hidup Bagi Usaha/Kegiatan yang Telah Memiliki Izin Usaha dan/atau Kegiatan tetapi Belum Memiliki Dokumen Lingkungan Hidup dan Pedoman Analisis Lingkungan Hidup (Environmental Assessment Guidelines), ADB, 2003 serta mengadakan pelatihan pengelolaan lingkungan hidup.

5. Batas Wilayah Analisis

a. Batas Proyek

Batas proyek merupakan ruang tempat berlangsungnya kegiatan rehabilitasi/konstruksi saluran irigasi hingga operasi dan pemeliharaan jaringan irigasi yang meliputi 7 (tujuh) Sub-Daerah Irigasi (Sub-D.I), yaitu: Sub-D.I Bekri, Sub-D.I. Punggur Utara, Sub-D.I. Raman Utara, Sub-D.I. Sekampung Batanghari, Sub-D.I. Sekampung Bunut, Sub-D.I. Rumbia Barat, dan Sub-D.I. Batanghari Utara dengan total luas 55.373 ha.

b. Batas Ekologi

Batas ekologi, yaitu ruang terjadinya sebaran dampak-dampak lingkungan dari rencana kegiatan pengembangan Sistem Irigasi Way Sekampung yang akan dianalisis, mengikuti media lingkungan masing-masing (seperti air dan udara), di mana proses alami yang berlangsung dalam ruang tersebut diperkirakan akan mengalami perubahan. Batas ekologi akan mengarahkan penentuan lokasi pengumpulan data rona lingkungan dan analisis persebaran dampak. Penentuan batas ekologi mempertimbangkan setiap komponen lingkungan biogeofisik- kimia yang terkena dampak yang meliputi:

- pemukiman penduduk pada radius 100 m dari lokasi tapak rehabilitasi saluran irigasi sesuai dengan arah angin dominan yang merupakan daerah pengaruh sebaran udara ambien dan kebisingan.
- Sungai Way Sekampung 450 m di hulu Bendung Argoguruh yang merupakan rona lingkungan kualitas air termasuk salinitas dan keanekaragaman plankton dan benthos dan 60 km di hilir Bendung Argoguruh yang merupakan daerah pengaruh gangguan terhadap kualitas air sungai dan intrusi air laut, karena berkurangnya debit aliran ekologi pada musim kemarau.
- pemukiman penduduk (air sumur) pada radius 10 m dari lokasi lahan sawah yang merupakan daerah pengaruh kadar pupuk dan pestisida melewati rembesan air irigasi akibat pemakaian pupuk dan pestisida yang berlebihan dan pengaruh salinitas.
- saluran drainase Sub-daerah irigasi terujung (sekitar 60 km) di sebelah hilir Bendung Argoguruh yang merupakan daerah pengaruh pencucian unsur hara, karena penggunaan air irigasi yang berlebihan dan limpasan air irigasi yang tercemar dan mengandung kadar garam serta risiko terhadap kesehatan masyarakat, karena pemakaian pupuk dan pestisida yang berlebihan.

c. Batas Sosial

Batas sosial adalah ruang disekitar lokasi rehabilitasi/konstruksi saluran irigasi yang merupakan tempat berlangsungnya berbagai interaksi sosial yang mengandung norma dan nilai tertentu yang sudah mapan (termasuk sistem dan struktur sosial), sesuai dengan proses dan dinamika sosial suatu kelompok masyarakat, yang diperkirakan akan mengalami perubahan akibat rencana kegiatan tersebut. Batas ini pada dasarnya merupakan ruang di mana masyarakat yang terkena dampak lingkungan berada atau melakukan kegiatan di desa-desa dan kecamatan-kecamatan di sekitar lokasi rehabilitasi/konstruksi saluran irigasi. Batas sosial akan mempengaruhi identifikasi kelompok masyarakat yang terkena dampak sosial-ekonomi-kesehatan masyarakat dan penentuan masyarakat yang perlu dikonsultasikan.

d. Batas Administrasi

Batas administrasi analisis lingkungan meliputi desa-desa di kecamatan-kecamatan di Kabupaten Lampung Timur, Kabupaten Lampung Tengah, Kabupaten Pesawaran, dan Kota Metro, Provinsi Lampung yang wilayahnya mencakup tiga batas diatas, sebagaimana ditunjukkan pada tabel di bawah ini.

Tabel 6 - Lokasi Administrasi Kecamatan dan Kabupaten

No.	Kecamatan	Kabupaten/Kota	Provinsi
1.	Batanghari	Lampung Timur	Lampung
2.	Sekampung		
3.	Margatiga		
4.	Sukadana		
5.	Bumiagung		
6.	Batanghari Nuban		

No.	Kecamatan	Kabupaten/Kota	Provinsi
7.	Pekalongan		
8.	Raman Utara		
9.	Probolinggo		
10.	Way Bungur		
11.	Gunung Sugih	Lampung Tengah	
12.	Bekri		
13.	Bumi Ratu Nuban		
14.	Trimurjo		
15.	Punggur		
16.	Kota Gajah		
17.	Seputih Raman		
18.	Seputih Banyak		
19.	Rumbia		
20.	Tegineneng	Pesawaran	
21.	Metro Selatan	Metro	
22.	Metro Barat		
23.	Metro Timur		
24.	Metro Pusat		
25.	Metro Utara		

Sumber: Biro Pusat Statistik, 2016.

e. Batas Wilayah Analisis

Batas wilayah analisis lingkungan merupakan garis luar gabungan keempat batas yang mencakup batas proyek, batas ekologi, batas sosial dan batas administrasi. Peta Batas Wilayah Analisis disajikan pada Lampiran.

6. Isu-isu Lingkungan dan K3 yang harus dianalisis

a. Penentuan Lokasi Proyek (Audit)

- 1) Keberadaan lokasi proyek terhadap daerah sensitif lingkungan/kawasan lindung (berdekatan dengan atau di dalam):
 - a) Kawasan Lindung: Taman Nasional Way Kambas
 - b) Kawasan Lindung:.....
 - c) Lahan Basah (Rawa-rawa)
 - d) Bakau
 - e) Muara
 - f) Zona penyangga Kawasan Lindung
 - g) Daerah khusus untuk perlindungan keanekaragaman hayati.

b. Tahap Rehabilitasi/Konstruksi

Persiapan Rehabilitasi/Konstruksi

- 2) Keresahan / kecemburuan sosial tenaga kerja lokal.
- 3) Konflik sosial terkait tenaga kerja, jika tenaga kerja yang diterima dari luar daerah.
- 4) Penurunan kualitas udara dan peningkatan kebisingan akibat pengoperasian *base camp*/barak kerja.
- 5) Penurunan kualitas udara dan peningkatan kebisingan akibat pembersihan lahan saluran.

Pelaksanaan Rehabilitasi/ Konstruksi

- 6) Peningkatan kebisingan, karena pengoperasian peralatan konstruksi.
- 7) Peningkatan kadar debu, karena pengoperasian peralatan konstruksi.
- 8) Kemacetan lalu lintas, akibat transportasi pengangkutan puing lapisan saluran dan sedimen ke tempat penimbunan.
- 9) Hambatan-hambatan untuk pergerakan/ perpindahan/mobilisasi manusia dan hewan.
- 10) Erosi tanah sebelum pematatan dan pelapisan/pemasangan beton pracetak, akibat pematatan dan pelapisan/pemasangan beton pracetak.

c. Tahap Operasi & Pemeliharaan (Audit)

- 1) Hilangnya nilai-nilai ekologi yang berharga, karena keberadaan jalan inspeksi yang menyebabkan perambahan ke hutan lindung, taman nasional, habitat satwa liar, rawa-rawa, dll. atau bangunan / kawasan bersejarah / budaya, gangguan hidrologi saluran air alami, bahaya banjir dan drainase.
- 2) Hambatan-hambatan untuk pergerakan/ perpindahan/mobilisasi manusia dan hewan.
- 3) Penurunan debit aliran ekologi/aliran pemeliharaan pada musim kemarau ke Sungai Way Sekampung di hilir Bendung Argoguruh.
- 4) Potensi masalah ekologi, karena meningkatnya erosi tanah dan pendangkalan yang menyebabkan penurunan kapasitas aliran air.
- 5) Konflik dalam hak pasokan air terkait dengan konflik sosial.
- 6) Penurunan kualitas air di hilir dan oleh karena itu, penurunan penggunaan air yang bermanfaat di hilir.
- 7) Pengurangan pasokan air di hilir selama musim puncak.
- 8) Intrusi air laut ke dalam sistem air tawar di hilir.
- 9) Drainase yang tidak mencukupi/memadai yang menyebabkan terjadinya intrusi salinitas.
- 10) Dampak yang tidak proporsional terhadap penduduk miskin, perempuan dan anak-anak, penduduk asli atau kelompok rentan lainnya.
- 11) Penggenangan air permanen (*waterlogging*) dan salinisasi tanah, karena tidak memadainya drainase dan pengelolaan pertanian.

Penggenangan air permanen (*waterlogging*) dapat terjadi karena tinggi muka air tanah meningkat hingga menenggelamkan akar tanaman.

- 12) Pencucian unsur hara dan perubahan karakteristik tanah, karena penggunaan air irigasi yang berlebihan. Kemungkinan telah terjadinya erosi air terhadap tanah pertanian yang telah digunakan untuk bercocok tanam padi selama ini.
- 13) Polusi tanah dan limpasan air irigasi dan air tanah yang tercemar serta risiko terhadap kesehatan masyarakat, karena pemakaian pupuk dan pestisida yang berlebihan.

Irigasi dapat berpotensi menurunkan kualitas air sungai, karena air bilasan dari lahan pertanian dapat mengandung garam, pupuk, dan pestisida, sehingga dapat terakumulasi di sungai di bagian hilir.

Air bilasan dari lahan pertanian juga dapat mengalami perkolasasi dan mencemari tanah dan air tanah.
- 14) Penyumbatan saluran-saluran irigasi oleh sedimen.
- 15) Penyumbatan saluran-saluran irigasi oleh gulma air (eceng gondok).
- 16) Pengenalan/peningkatan kejadian penyakit yang berhubungan dengan air atau penyakit terkait air.
- 17) Arus populasi (datangnya penduduk) dalam jumlah besar selama konstruksi dan operasi proyek yang menyebabkan peningkatan beban pada infrastruktur dan layanan-layanan (seperti pasokan air dan sistem sanitasi).
- 18) Bahaya-bahaya menyangkut lingkungan kerja yang aman dan sehat, karena bahaya-bahaya fisik, kimia, dan biologi selama rehabilitasi/konstruksi dan operasi proyek.
- 19) Risiko-risiko terhadap keselamatan dan kesehatan masyarakat, karena transportasi, penyimpanan, dan penggunaan dan / atau pembuangan bahan-bahan seperti bahan peledak, bahan bakar dan bahan kimia lainnya selama konstruksi dan operasi.
- 20) Risiko-risiko keselamatan masyarakat, karena bahaya kecelakaan dan bahaya alam, terutama di mana elemen struktur atau komponen proyek (misalnya, bendung irigasi) dapat diakses oleh anggota masyarakat yang terkena dampak atau di mana kegagalan mereka dapat mengakibatkan cedera pada masyarakat selama konstruksi, operasi dan penonaktifan (*decommissioning*) proyek.
- 21) Kecukupan proses, seperti partisipasi, konsultasi, penyelesaian pengaduan dan penanganan dampak lingkungan hidup yang terkait dengan pelaksanaan proyek.
- 22) Peningkatan kemampuan lembaga pelaksana di bidang pengelolaan lingkungan hidup dengan pelatihan tentang supervisi, pelaporan, dan pemantauan pelaksanaan rencana pengelolaan lingkungan hidup.

7. Metodologi

a. Metode Pengumpulan Data

- 1) Kualitas Udara dan Kebisingan

- a) Lokasi-lokasi pengambilan sampel kualitas udara ambien yang mewakili daerah rehabilitasi saluran primer dan sekunder (Sub-D.I. Bekri, Sub-D.I. Punggur Utara, Sub-D.I. Raman Utara, Sub-D.I. Sekampung Batanghari, Sub-D.I. Sekampung Bunut, Sub-D.I. Rumbia Barat dan Sub-D.I. Batanghari Utara), dan pemukiman penduduk terdekat di sekitar lokasi proyek (7 lokasi x 3 sampel).
 - b) Parameter kualitas udara, meliputi Nitrogen Dioksida (NO_2), Sulfur Dioksida (SO_2), Karbon Monoksida (CO), Hidrocarbon (HC), Debu (TSP), dan Timah Hitam (Pb).
 - c) Metode analisis dan peralatan pengambilan contoh dan pengukuran sesuai dengan Lampiran Peraturan Pemerintah Republik Indonesia Nomor 41 Tahun 1999 tentang Pengendalian Pencemaran Udara.
 - d) Lokasi-lokasi pengukuran sampel tingkat kebisingan yang mewakili daerah rehabilitasi saluran primer dan sekunder di 7 Sub-D.I. (7 lokasi x 2 sampel) dan pemukiman penduduk terdekat di sekitar lokasi proyek sesuai arah angin dominan (7 lokasi x 1 sampel).
 - e) Peralatan, metode pengukuran dan evaluasi tingkat kebisingan sesuai dengan Lampiran II Keputusan Menteri Negara Lingkungan Hidup Nomor: KEP-48/MENLH/11/1996 tentang Baku Tingkat Kebisingan.
- 2) Kualitas Air Permukaan dan Kualitas Air Tanah
 - a) Pengambilan sampel kualitas air permukaan yang mewakili Sungai Way Sekampung di hulu Bendung Argoguruh pada jarak 100 m dan 450 m (2 lokasi x 1 sampel) dan contoh kualitas air buangan irigasi yang mewakili air buangan dari 3 Sub-D.I. (1 lokasi x 3 Sub-D.I. x 1 sampel) dengan parameter sesuai dengan Lampiran Peraturan Pemerintah Nomor 82 Tahun 2001 tentang Pengelolaan Kualitas Air dan Pengendalian Pencemaran Air Kelas I (tidak termasuk parameter radioaktif) yang relevan dengan pencucian unsur hara, karena penggunaan air irigasi yang berlebihan dan limpasan air irigasi yang tercemar serta risiko terhadap kesehatan masyarakat, karena pemakaian pupuk dan pestisida yang berlebihan dan parameter salinitas air sungai (1 lokasi x 3 Sub-D.I. x 1 sampel).
 - b) Pengambilan sampel kualitas air permukaan yang mewakili Sungai Way Sekampung di bagian hulu Bendung Argoguruh pada jarak 100 m dan 450 m (2 lokasi x 1 sampel) dan contoh kualitas air permukaan yang mewakili Sungai Way Sekampung di bagian hilir 60 km dari Bendung Argoguruh (1 lokasi x 1 sampel) dengan parameter kualitas air Kelas I dan salinitas air sungai.
 - c) Pengambilan sampel kualitas air permukaan yang mewakili 3 saluran irigasi primer (3 lokasi X 1 sampel) dan 3 saluran irigasi sekunder (3 lokasi X 1 sampel).
 - d) Pengambilan sampel kualitas air tanah (air sumur) yang mewakili lokasi disekitar daerah irigasi Way Sekampung dengan parameter yang relevan dengan pemakaian pupuk dan pestisida yang berlebihan dan parameter salinitas air (1 lokasi x 7 Sub-D.I. x 1 sampel).
 - 3) Debit Aliran Ekologi
 - a) Pengumpulan data dan informasi tentang Pedoman Prosedur Operasi Standar (SOP) atau Panduan operasi Bendung Argoguruh yang mengatur operasi pintu-pintu irigasi dan pintu penguras (*flushing gate*) untuk pembagian debit air sungai untuk kebutuhan irigasi dan kebutuhan minimal aliran ekologi/aliran pemeliharaan sungai (m^3/det) terutama pada musim kemarau.

- b) Pengumpulan data dan informasi dengan wawancara tentang pelaksanaan SOP atau Panduan operasi Bendung Argoguruh oleh Petugas Operasi Bendung (POB) untuk mengalirkan debit minimal aliran ekologi/aliran pemeliharaan pada musim kemarau.

4) Kualitas Tanah

- a) Pengambilan sampel kualitas tanah yang mewakili 7 Sub-D.I. dengan parameter yang relevan dengan pencucian unsur hara (kandungan semua unsur hara di dalam tanah yang subur yang diperlukan oleh tanaman), karena penggunaan air irigasi yang berlebihan dan limpasan air irigasi yang tercemar, karena pemakaian pupuk dan pestisida yang berlebihan (1 lokasi x 7 Sub-D.I x 1 sampel).
- b) Pengambilan sampel kualitas tanah yang mewakili 7 Sub-D.I. untuk analisis erosi tanah (faktor erodibilitas tanah), yang meliputi ukuran partikel, bahan organik, struktur tanah, dan permeabilitas untuk dianalisa di laboratorium (1 lokasi x 7 Sub-D.I x 1 sampel).
- c) Pengambilan sampel kualitas tanah yang mewakili tanah yang tidak mengalami pencucian unsur hara, karena penggunaan air irigasi yang berlebihan dan tidak terpolusi oleh pemakaian pupuk dan pestisida yang berlebihan, seperti tanah kebun campuran,, pekarangan, semak belukar (1 lokasi x 2 sampel).

5) Tumbuhan dan Satwa Liar

- a) Pengumpulan data keberadaan tumbuhan dan satwa liar darat dan biota perairan di Daerah Irigasi Way Sekampung dan sekitarnya, terutama yang rentan dan terancam kepunahan (dilindungi) dan endemik.
- b) Pengumpulan data jarak batas terluar Sub-D.I. Batanghari Utara dengan batas terluar Kawasan Lindung Taman Nasional Way Kambas.
- c) Pengumpulan data keberadaan tumbuhan dan satwa liar di Kawasan Lindung Taman Nasional Way Kambas yang berbatasan dengan Sub-D.I. Batanghari Utara.

6) Plankton dan Benthos

- a) Pengambilan sampel plankton dan benthos yang mewakili Sungai Way Sekampung di hulu Bendung Argoguruh pada jarak 100 m dan 450 m (2 lokasi x 1 sampel) dan contoh plankton dan benthos yang mewakili air buangan dari 7 Sub-D.I. (1 lokasi x 7 Sub D.I. x 1 sampel).
- b) Pengambilan sampel plankton dan benthos yang mewakili Sungai Way Sekampung di bagian tengah 20 km dan 40 km dan di bagian hilir 60 km dari Bendung Argoguruh (3 lokasi x 1 sampel).

7) Sosial, Ekonomi, Budaya dan Kesehatan Masyarakat

- a) Konsultasi Publik dan Keterbukaan Informasi. Pengumpulan data tentang sosial ekonomi budaya dikumpulkan dengan melakukan konsultasi publik dan keterbukaan informasi untuk menginformasikan kepada masyarakat yang terkena dampak yang mencakup masyarakat yang akan mendapat manfaat atau dampak positif dan masyarakat yang akan mengalami kerugian atau mendapatkan dampak negatif. dan lembaga swadaya masyarakat setempat serta melibatkan pemerhati lingkungan hidup , dan pengungkapan informasi proyek dan besaran/ukuran potensi dampak lingkungan hidup (baik positif maupun negatif), dan upaya-upaya penanganan dampak lingkungan hidup yang diusulkan, agar diperoleh saran, masukan dan tanggapan guna menyempurnakan rencana

pengelolaan dan pemantauan lingkungan hidup yang sesuai dengan kondisi lapangan dan harapan masyarakat.

- b) Di dalam undangan konsultasi publik agar diinformasikan mengenai tujuan konsultasi publik, waktu dan tempat pelaksanaan konsultasi publik, bentuk, cara dan metode konsultasi publik yang akan dilakukan dan lingkup saran, pendapat dan tanggapan dari masyarakat. Bentuk, cara dan metode konsultasi publik dapat berupa *focus group discussion* atau temu warga; dan/atau bentuk, cara dan metode lain yang dapat digunakan untuk berkomunikasi secara dua arah. Dalam pelaksanaan konsultasi publik dan keterbukaan informasi perlu disampaikan informasi minimal mengenai nama dan alamat pemrakarsa, jenis rencana kegiatan, skala/besaran dari rencana kegiatan, lokasi rencana kegiatan dilengkapi dengan informasi perihal batas administratif terkecil dari lokasi tapak proyek dan peta tapak proyek, dampak potensial yang akan timbul dari identifikasi awal seperti potensi timbulnya limbah, potensi keresahan masyarakat, dan lain-lain dan konsep umum pengendalian dampaknya, dan komponen lingkungan yang akan terkena dampak dari rencana kegiatan.
 - c) Wawancara dengan penduduk yang bertempat tinggal di hilir Bendung Argoguruh yang mewakili penduduk di bagian tengah 20 km dan 40 km dan di bagian hilir 60 km dari Bendung Argoguruh dengan menggunakan kuesioner dengan jumlah responen yang mewakili penduduk yang memanfaatkan air Sungai Way Sekampung untuk keperluan MCK dan lainnya.
 - d) Pengamatan visual debit aliran pemeliharaan sungai di lokasi 20 km dan 40 km dan di bagian hilir 60 km dari Bendung Argoguruh (dokumentasi).
 - e) Pengamatan visual dan wawancara dengan penduduk sekitar tentang keberadaan aliran anak-anak sungai Way Sekampung di sekitar bagian tengah 20 km dan 40 km dan di bagian hilir 60 km dari Bendung Argoguruh yang berfungsi sebagai aliran pemeliharaan sungai.
 - f) Mengadakan FGD atau wawancara dengan Kepala UPTD, Pengamat, Mantri, PPA (Petugas Pintu Air), POB, PPL, Ili-ili, P3A, GP3A, Poktan, Gapoktan dan petani dengan menggunakan kuesioner dengan jumlah responen yang mewakili petani di 7 sub-daerah irigasi untuk melengkapi penanganan isu-isu lingkungan dan K3 yang tersebut pada Bab 6.
 - g) Bila metode deskriptif yang digunakan, maka untuk populasi besar jumlah minimal sampel 10 % dari populasi.
- 8) Keselamatan dan Kesehatan Kerja dan Masyarakat
- a) Pengumpulan data dan informasi tentang Pedoman Operasi dan Pemeliharaan Standar, (SOP atau Panduan) saluran dan bangunan Irigasi yang tersedia ke PPK O&P BBWSMS, termasuk keselamatan tenaga kerja O & P dalam pemeliharaan (penanganan potongan kayu dan sampah) yang tertambat di pintu bendung (feeder canal) saat banjir dan pemeliharaan (pengecatan dll.) pintu otomatis flap gate dan bangunan-bangunan lain di ketinggian.
 - b) Pengumpulan data dan informasi berupa foto-foto pekerjaan O & P untuk memperoleh temuan-temuan "kegiatan tak aman" dan "kondisi tak aman".
 - c) Pengumpulan data dan informasi dengan wawancara dengan perwakilan petugas O & P tentang penerapan Keselamatan dan Kesehatan Kerja (K3) yang telah dilakukan selama ini untuk memperoleh temuan-temuan "kegiatan tak aman" dan "kondisi tak aman".

- d) Keselamatan transportasi masyarakat melewati jembatan penyeberangan di atas saluran irigasi yang tidak dilengkapi dengan handrail/pagar.
- e) Pengumpulan data tentang keberadaan bangunan atau struktur yang dalam kondisi tak aman atau berbahaya, karena kurang memadainya pagar pengaman/railing, sehingga berisiko terjadinya kecelakaan bagi petugas O & P dan/atau masyarakat.
- f) Pengumpulan data pemasangan rambu-rambu larangan bermain, larangan mandi/berenang, larangan mencuci pakaian, hati-hati dan rambu-rambu lainnya di area Bendung Argoguruh, Feeder Canal I, Feeder Canal II, saluran primer dan saluran sekunder.
- g) Pengumpulan data dan informasi dengan wawancara dengan perwakilan masyarakat untuk memperoleh temuan kejadian kecelakaan penduduk sekitar, karena mereka memasuki wilayah Daerah Irigasi Way Sekampung atau memanfaatkan fasilitas proyek.

Lokasi-lokasi pengambilan sampel kualitas udara dan kebisingan, kualitas air permukaan dan air tanah, salinitas air, kualitas tanah, plankton dan benthos, dan sosial, ekonomi, budaya dan kesehatan masyarakat dan lokasi Kawasan Lindung ditunjukkan pada peta-peta di Lampiran.

b. Metode Analisis Data

- 1) Kualitas Udara dan Kebisingan
 - a) Hasil analisa laboratorium kualitas udara ambien dibandingkan dengan baku mutu udara ambien menurut Baku Mutu Udara Ambien Nasional Lampiran Peraturan Pemerintah Republik Indonesia Nomor 41 Tahun 1999 tentang Pengendalian Pencemaran Udara.
 - b) Hasil analisa laboratorium kualitas udara ambien dibandingkan dengan standar World Health Organization (WHO), 2005, sebagaimana tersebut pada Tabel 1.1.1: WHO Ambient Air Quality Guidelines, Air Emissions and Ambient Air Quality, International Finance Corporation (IFC).
 - c) Hasil pengukuran, perhitungan, dan evaluasi tingkat kebisingan dibandingkan dengan baku tingkat kebisingan sesuai dengan Lampiran I Keputusan Menteri Negara Lingkungan Hidup Nomor: KEP-48/MENLH/11/1996 tentang Baku Tingkat Kebisingan.
 - d) Hasil pengukuran, perhitungan, dan evaluasi tingkat kebisingan dibandingkan dengan standar WHO, 1999, sebagaimana tersebut pada Tabel 1.7.1-Noise Level Guidelines, Noise Management, IFC.
- 2) Kualitas Air Permukaan dan Kualitas Air Tanah
 - a) Hasil analisa laboratorium kualitas air sungai, kualitas air irigasi, dan kualitas air buangan irigasi dibandingkan dengan baku mutu air menurut Lampiran Peraturan Pemerintah Nomor 82 Tahun 2001 tentang Pengelolaan Kualitas Air dan Pengendalian Pencemaran Air Kelas I dan Kelas IV.
 - b) Hasil analisa laboratorium kualitas air tanah dibandingkan dengan daftar persyaratan kualitas air minum menurut Lampiran I Peraturan Menteri Kesehatan Republik Indonesia Nomor: 416/MENKES/PER/IX/1990 tentang Syarat-syarat dan Pengawasan Kualitas Air.
 - c) Hasil analisa laboratorium atau pengukuran salinitas air sungai dan air tanah dibandingkan dengan klasifikasi: air tawar, air payau atau air asin.

Salinitas	Air tawar	Air payau	Air asin
%o	< 0,5	0,5 – 30	30 – 50

- d) Hasil analisa laboratorium kualitas air dibandingkan dengan standar IFC dan/atau standar internasional lainnya, seperti standar kualitas air irigasi (Guy Fipps, Irrigation Water Quality Standards and Salinity Management Strategies. Associate Professor and Extension Agricultural Engineer, Department of Agricultural Engineering, The Texas A&M System, College Station, Texas 77843-2117)
- e) Status kualitas air tersebut agar diklasifikasikan menurut STORET U.S. EPA.
- 3) Debit Aliran Ekologi
- a) Kaji ulang SOP operasi Bendung Argoguruh yang mengatur operasi pintu-pintu irigasi dan pintu penguras (*flushing gate*) untuk pembagian debit air sungai untuk kebutuhan irigasi dan kebutuhan minimal aliran ekologi/aliran pemeliharaan sungai sebagaimana dipersyaratkan dalam Peraturan Pemerintah Republik Indonesia No. 38 Tahun 2011 tentang Sungai atau kebutuhan minimal aliran ekologi yang dipersyaratkan oleh aturan atau standar internasional.
- b) Memperbaiki dan memperbarui SOP operasi Bendung Argoguruh untuk memastikan kebutuhan minimal aliran ekologi/aliran pemeliharaan sungai dapat diterapkan pelaksanaannya oleh POB terutama pada musim kemarau.
- 4) Kualitas Tanah
- a) Hasil analisa laboratorium kualitas tanah yang mewakili 7 Sub-D.I. dengan parameter yang relevan dengan pencucian unsur hara, karena penggunaan air irigasi yang berlebihan dan limpasan air irigasi yang tercemar, karena pemakaian pupuk dan pestisida yang berlebihan dengan dibandingkan dengan hasil analisa laboratorium kualitas tanah yang tidak mengalami pencucian unsur hara dan tidak tercemar oleh pemakaian pupuk dan pestisida yang berlebihan (tanah kebun campuran, pekarangan, semak belukar).
- b) Hasil analisa laboratorium faktor erodibilitas tanah yang mewakili 7 Sub-D.I. untuk analisis erosi tanah dengan "Persamaan Umum Kehilangan Tanah" atau formula Universal Soil Loss Equation (USLE).
- c) Analisis tingkat polusi terhadap tanah di 7 Sub D.I. akibat pemakaian pupuk dan pestisida yang berlebihan.
- d) Analisis tingkat kesuburan tanah di 7 Sub D.I., karena telah mengalami pencucian unsur hara, akibat penggunaan air irigasi yang berlebihan dengan membandingkan ketersediaan kandungan unsur hara di dalam tanah tersebut dengan ketersediaan kandungan semua unsur hara di dalam tanah yang subur yang diperlukan oleh tanaman.
- 5) Tumbuhan dan Satwa Liar
- a) Analisis terjadinya dampak negatif dan positif terhadap keberadaan tumbuhan dan satwa liar darat dan biota perairan di Daerah Irigasi Way Sekampung dan sekitarnya, terutama yang rentan dan terancam kepunahan (dilindungi) dan endemik.
- b) Keberadaan tumbuhan dan satwa dibandingkan dengan Peraturan Pemerintah Republik Indonesia Nomor 7 Tahun 1999 tentang Pengawetan Jenis Tumbuhan dan Satwa dan The International Union for Conservation of Nature (IUCN) Red List of Threatened Species (Red

Data List). 1964 dan daftar spesies tumbuhan dan spesies satwa dilindungi dan endemik lain baik ditingkat lokal, nasional maupun internasional.

- c) Analisis terjadinya dampak negatif dan positif terhadap keberadaan tumbuhan dan satwa liar di Kawasan Lindung Taman Nasional Way Kambas yang berbatasan dengan Sub-D.I. Batanghari Utara akibat operasional dan rehabilitasi saluran irigasi tersebut (kondisi awal/sebelum tahun 1935 dan kondisi saat ini).
- 6) Plankton dan Benthos
- Hasil pengumpulan data harus menunjukkan indeks keanekaragaman plankton dan benthos yang dapat digunakan untuk analisis kualitas air sungai di lokasi-lokasi tersebut dengan klasifikasi: tidak tercemar, tercemar ringan, tercemar sedang atau tercemar berat.

Klasifikasi Derajat Pencemaran (Lee, 1978)

Derajat Pencemaran	Nilai Indeks Keanekaragaman
Tidak	> 2,0
Ringan	2,0 - 1,6
Sedang	1,5 - 1,0
Berat	< 1,0

Keanekaragaman Shannon-Wiener (Stilling, 1996)

Derajat Pencemaran	Nilai Indeks Keanekaragaman (H')
Tidak	>3
Sedang	1-3
Berat	<1

- 7) Sosial, Ekonomi, Budaya dan Kesehatan Masyarakat
- a) Hasil konsultasi publik disajikan dalam Berita Acara yang ditandatangani minimal oleh perwakilan masyarakat yang terkena dampak dan kepala desa setempat dan dokumentasi.
 - b) Analisis isi Berita Acara tersebut untuk menyempurnakan rencana pengelolaan dan pemantauan lingkungan hidup, sehingga dapat dilaksanakan di lapangan sesuai dengan harapan masyarakat.

- 8) Keselamatan dan Kesehatan Kerja dan Masyarakat
 - a) Kaji ulang SOP Operasi dan Pemeliharaan (Panduan) saluran dan bangunan Irigasi untuk mengetahui sejauh mana upaya-upaya Keselamatan dan Kesehatan Kerja (K3) sudah dipertimbangkan, guna pencegahan kecelakaan kerja dan timbulnya penyakit akibat kerja dan pengamanan masyarakat disekitarnya.
 - b) Memperbaiki dan memperbarui SOP Operasi dan Pemeliharaan (Panduan) saluran dan bangunan Irigasi, termasuk Panduan pemeliharaan (penanganan potongan kayu dan sampah) yang tertambat di pintu bendung (feeder canal) saat banjir dan pemeliharaan (pengecatan dll.) pintu otomatis flap gate dan bangunan-bangunan lain di ketinggian.
 - c) Analisis upaya-upaya peningkatan *awareness* atau penyadartahuan petugas O & P tentang penerapan K3.
 - d) Analisis lokasi pemasangan dan jenis pagar pengaman/railing yang memadai pada bangunan atau struktur, termasuk jembatan penyeberangan di atas saluran irigasi yang tidak dilengkapi dengan handrail/pagar sebagai sarana transportasi masyarakat, agar dalam kondisi aman atau tidak berbahaya bagi petugas O & P dan/atau masyarakat.
 - e) Analisis lokasi dan jenis rambu-rambu yang harus dipasang pada pekerjaan rehabilitasi/konstruksi jaringan irigasi.
 - f) Analisis lokasi dan jenis rambu-rambu yang harus dipasang di area Bendung Argoguruh, Feeder Canal I, Feeder Canal II, saluran primer dan saluran sekunder.
 - g) Analisis upaya-upaya peningkatan penyadartahuan masyarakat tentang penerapan keselamatan untuk tidak memasuki wilayah pekerjaan rehabilitasi/konstruksi dan kawasan Daerah Irigasi Way Sekampung yang berbahaya.

c. Metode Evaluasi

Kajian evaluasi isu-isu lingkungan dan K3 tersebut pada Bab 6 di atas mencakup beberapa hal:

- 1) Keterkaitan antara komponen kegiatan yang menjadi sumber dampak, dampak atau limbah yang dihasilkan sumber dampak, rona lingkungan terkena dampak, baku mutu/peraturan/izin perlindungan dan pengelolaan lingkungan hidup yang relevan dengan sumber dampak dan dampak yang dihasilkan, efektifitas upaya pengelolaan dan pemantauan yang telah dilakukan, serta informasi kegiatan dan kondisi lingkungan di sekitar.
- 2) Hasil kajian evaluasi dampak harus dapat menyimpulkan mengenai dampak yang terjadi, efektivitas pengelolaan dan pemantauan lingkungan yang telah dilakukan, serta usulan pengelolaan dan pemantauan lingkungan yang seharusnya dilakukan.
- 3) Kajian evaluasi dampak dilakukan dalam rangka menentukan (kuantifikasi) seberapa jauh/besar langkah-langkah pengelolaan dan pemantauan lingkungan yang harus dilakukan untuk setiap dampak yang terjadi.
- 4) Hasil kajian evaluasi merumuskan arahan pengelolaan dan pemantauan lingkungan hidup yang menjadi dasar bagi penyusunan RKL-RPL yang lebih detail/rinci dan operasional. Pastikan hasil evaluasi memberikan arahan bagi perencanaan pengelolaan dan pemantauan lingkungan hidup yang meliputi:
 - a) Arahannya tindakan perbaikan dan penanggulangan yang paling tepat atas dampak yang telah terjadi terhadap lingkungan dan pemantauan hasilnya.

- b) Arahan atas upaya pengelolaan dan pemantauan lingkungan bagi aspek lingkungan lain yang penting serta dapat menimbulkan dampak lingkungan.

d. Metode Pengelolaan Lingkungan Hidup

Rencana Pengelolaan Lingkungan Hidup (RKL) adalah upaya penanganan dampak lingkungan yang ditimbulkan dari rencana kegiatan. Rencana Pemantauan Lingkungan Hidup (RPL) adalah upaya pemantauan komponen lingkungan hidup yang terkena dampak dari rencana kegiatan.

Berdasarkan hasil dari kajian evaluasi dan kesimpulan efektifitas pengelolaan dan pemantauan lingkungan hidup, termasuk lokasi pengelolaan dan lokasi titik pemantauan lingkungan hidup, serta pembagian tugas dan kewenangan kepada pihak yang bertanggung jawab dalam melaksanakan RKL-RPL, maka dalam RKL-RPL harus memuat mengenai upaya untuk menangani dampak dan memantau komponen lingkungan hidup yang terkena dampak. Beberapa dampak dari hasil evaluasi yang disimpulkan sebagai bukan dampak penting, namun tetap memerlukan dan direncanakan untuk dikelola dan dipantau (dampak lingkungan hidup lainnya), maka tetap perlu disertakan rencana pengelolaan dan pemantauannya dalam RKL-RPL.

e. Metode Pelatihan

- 1) Pelatihan dilakukan secara Loka Karya (*Workshop*) selama 1 (satu) hari.
- 2) Jumlah peserta maksimum 10 (sepuluh) orang dari BBWSMS yang berhubungan dengan pekerjaan pelaporan [pelaksanaan](#) pengelolaan lingkungan hidup DELH, yang antara lain: staf-staf Satker, PJPA dan PPK.
- 3) Persyaratan peserta minimum sarjana S1 dan telah bekerja selama 10 tahun.
- 4) Peserta lebih baik membawa laptop, agar dapat langsung simulasi pengisian form-form.
- 5) Materi pelatihan tentang supervisi, pelaporan dan pemantauan pelaksanaan pengelolaan lingkungan hidup mengacu Keputusan Menteri Negara Lingkungan Hidup Nomor: 45 Tahun 2005 tentang Pedoman Penyusunan Laporan Pelaksanaan RKL dan RPL.

I. Pendahuluan

1. Identitas Perusahaan
2. Lokasi Kegiatan
3. Deskripsi Kegiatan
4. Perkembangan Lingkungan Sekitar

II. Pelaksanaan dan Evaluasi

- A. Pelaksanaan
 1. RKL
 2. RPL
- B. Evaluasi
 1. Evaluasi Kecenderungan (*trend evaluation*)
 2. Evaluasi Tingkat Kritis (*critical level evaluation*)
 3. Evaluasi Penaatan (*compliance evaluation*).

III. Kesimpulan

1. Kesimpulan mengenai efektivitas pengelolaan lingkungan hidup dan kendala kendala yang dihadapi.
2. Kesimpulan mengenai kesesuaian hasil pelaksanaan pengelolaan lingkungan dan pemantauan lingkungan dengan rencana pengelolaan dan pemantauan dalam dokumen RKL dan RPL.

8. Tenaga Ahli yang Dibutuhkan

a. Persyaratan Tenaga Ahli

Persyaratan tenaga ahli yang dibutuhkan dan orang-bulan (o-b) disajikan pada tabel di bawah ini. Sub-konsultan dapat mengusulkan tenaga ahli yang sepadan sesuai dengan pendekatan/metodologi yang diusulkan, agar berhasil menyelesaikan pekerjaan sebagaimana yang diuraikan di Lingkup Analisis Lingkungan.

Tabel 7 - Keahlian yang Dibutuhkan

No.	Posisi	Jumlah Personil (orang)	Penugasan (bulan)	o-b
I	Tenaga Ahli			
1.	Ketua Tim merangkap Ahli Lingkungan	1	3	3,0
2.	Ahli Keselamatan dan Kesehatan Kerja	1	3	3,0
3.	Ahli Fisik Kimia	1	3	3,0
4.	Ahli Biologi	1	3	3,0
5.	Ahli Sosial Ekonomi dan Budaya	1	3	3,0
6.	Ahli Kesehatan Masyarakat	1	3	3,0
	Sub-total I			18
II	Tenaga Sub-Profesional			
1.	Asisten Ahli Lingkungan	3	3	9,0
2.	Asisten Ahli Keselamatan dan Kesehatan Kerja	3	3	9,0
3.	Asisten Ahli Fisik-Kimia-Biologi	3	3	9,0
4.	Asisten Ahli Sosial Ekonomi dan Budaya	3	3	9,0
5.	Asisten Kesehatan Masyarakat	3	3	9,0
III	Tenaga Pendukung			
1.	Operator Komputer	1	3	3,0
2.	Administrasi / Keuangan	1	3	3,0
3.	Surveyor	6	1,5	9,0
4.	Drafter/Operator CAD	3	1,5	4,5
	Sub-total II + III			64,5
	Total I+II+III			82,5

b. Uraian Tugas Tenaga Ahli

- 1) Ketua Tim merangkap Tenaga Ahli Lingkungan (3 orang-bulan)

- Ketua Tim merangkap tenaga ahli lingkungan harus sarjana ilmu lingkungan atau ilmu-ilmu terkait dengan bidang lingkungan dan irigasi yang memiliki pengalaman kerja minimal 10 tahun di bidang Amdal atau audit lingkungan.
- Dia harus kompeten dalam menyelesaikan penyusunan dokumen DELH dan IEE mulai dari pengumpulan dan analisis data dan kajian/evaluasi dampak lingkungan dan audit lingkungan sesuai dengan peraturan/pedoman tentang lingkungan hidup yang berlaku baik di Indonesia maupun Bank Pembangunan Asia (ADB).
- Dia harus kompeten dalam pengumpulan dan analisis data rona lingkungan awal yang relevan dengan analisis dampak lingkungan hidup.
- Dia akan bertanggung jawab memimpin dan berkontribusi untuk penyelesaian semua tugas-tugas anggota tim sesuai jadwal yang disepakati:
 - a) Memandu, mengarahkan, mengelola, dan melaporkan masukan dan keluaran masing-masing anggota tim.
 - b) Mengelola hubungan baik dengan pemerintah daerah/setempat dan pemangku kepentingan lainnya.
 - c) Mengidentifikasi masalah lingkungan dan manajemen yang mempengaruhi kemajuan dan kualitas pekerjaan serta melakukan upaya-upaya penyelesaiannya.
 - d) Memberikan arahan menyeluruh kepada semua anggota tim dan memantau kemajuan pekerjaan dan memastikan penyelesaian laporan DELH dan IEE sesuai dengan jadwal yang disepakati dengan Konsultan dan Direksi Pekerjaan.
 - e) Memimpin pelatihan peningkatan kapasitas lembaga pelaksana tentang pengelolaan lingkungan hidup berkaitan dengan supervisi, pelaporan dan pemantauan pelaksanaan RKL dan RPL.
 - f) Analisis dampak emisi debu pekerjaan rehabilitasi terhadap manusia, satwa dan tumbuhan.
 - g) Analisis dampak tingkat kebisingan pekerjaan rehabilitasi terhadap manusia, satwa dan tumbuhan.
 - h) Analisis pemakaian pestisida, herbisida dan pemakaian pupuk yang berlebihan terhadap kemungkinan terjadinya pencemaran air buangan, air tanah dan kesehatan masyarakat.
 - i) Upaya-upaya pencegahan terjadinya dampak emisi debu dan tingkat kebisingan pekerjaan rehabilitasi terhadap manusia, satwa dan tumbuhan.
 - j) Upaya pencegahan pencemaran air buangan, air tanah dan kesehatan masyarakat akibat pemakaian pestisida, herbisida dan pemakaian pupuk yang berlebihan.
 - k) Melaksanakan pelatihan peningkatan kapasitas lembaga pelaksana tentang pengelolaan lingkungan hidup berkaitan dengan supervisi, pelaporan dan pemantauan pelaksanaan RKL dan RPL.
 - l) Mendapatkan Surat Keputusan Kelayakan Lingkungan (SKKL) terhadap DELH dari Gubernur Kepala Daerah Provinsi Lampung.
 - m) Mendapatkan pengesahan Laporan IEE dari ADB.
 - n) Mendapatkan Izin Lingkungan dari Gubernur Kepala Daerah Provinsi Lampung.

2) Tenaga Ahli Keselamatan dan Kesehatan Kerja (3 orang-bulan)

- Tenaga ahli ini harus sarjana ilmu-ilmu terkait dengan bidang keselamatan dan kesehatan kerja yang memiliki sertifikat kelulusan pelatihan Keselamatan dan Kesehatan Kerja pengalaman kerja minimal 5 tahun di bidang keselamatan dan kesehatan kerja.
- Dia harus kompeten dalam pengumpulan dan analisis data rona lingkungan awal yang relevan dengan analisis dampak lingkungan hidup.
- Dia akan bertanggungjawab terhadap tugas-tugas berikut:
 - a) Analisis risiko pekerjaan rehabilitasi/ konstruksi, operasi dan pemeliharaan jaringan irigasi terhadap tenaga kerja konstruksi dan masyarakat.
 - b) Upaya-upaya pencegahan kecelakaan dan penyakit akibat kerja terhadap tenaga kerja konstruksi.
 - c) Upaya-upaya pencegahan kecelakaan dan timbulnya penyakit terhadap masyarakat sekitar.

3) Tenaga Ahli Fisik Kimia (3 orang-bulan)

- Tenaga ahli ini harus sarjana ilmu-ilmu fisika dan kimia atau ilmu-ilmu terkait dengan bidang lingkungan yang memiliki pengalaman kerja minimal 8 tahun di bidang Amdal atau audit lingkungan.
- Dia harus kompeten dalam pengumpulan dan analisis data rona lingkungan awal yang relevan dengan analisis dampak.
- Dia akan bertanggungjawab terhadap tugas-tugas berikut:
 - a) Analisis dampak-dampak negatif dan positif kegiatan rehabilitasi dan operasi dan pemeliharaan jaringan irigasi terhadap lingkungan fisik kimia.
 - b) Upaya-upaya pengelolaan dan pemantauan dampak-dampak negatif dan positif terhadap lingkungan fisik kimia.
- Tenaga ahli ini harus bekerja sama dengan Tenaga Ahli Kimia Lingkungan KPP Pengembangan Sistem Irigasi Way Sekampung dalam penyusunan DELH dan IEE.

4) Tenaga Ahli Biologi (3 orang-bulan)

- Tenaga ahli ini harus sarjana ilmu-ilmu biologi atau ilmu-ilmu terkait dengan bidang lingkungan yang memiliki pengalaman kerja minimal 8 tahun di bidang Amdal atau audit lingkungan.
- Dia harus kompeten dalam pengumpulan dan analisis data rona lingkungan awal yang relevan dengan analisis dampak.
- Dia akan bertanggungjawab terhadap tugas-tugas berikut:
 - c) Analisis dampak-dampak negatif dan positif kegiatan rehabilitasi dan operasi dan pemeliharaan jaringan irigasi terhadap lingkungan biologi.
 - d) Upaya-upaya pengelolaan dan pemantauan dampak-dampak negatif dan positif terhadap lingkungan biologi.
- Tenaga ahli ini harus bekerja sama dengan Tenaga Ahli Biologi Lingkungan KPP Pengembangan Sistem Irigasi Way Sekampung dalam penyusunan DELH dan IEE.

5) Tenaga Ahli Sosial Ekonomi dan Budaya (3 orang-bulan)

- o Tenaga ahli ini harus sarjana ilmu sosial ekonomi dan ilmu sosial budaya atau ilmu-ilmu terkait dengan bidang sosial ekonomi budaya yang memiliki pengalaman kerja minimal 6 tahun di bidang Amdal atau audit lingkungan.
- o Dia harus kompeten dalam pengumpulan dan analisis data rona lingkungan awal yang relevan dengan analisis dampak.
- o Dia akan bertanggungjawab terhadap tugas-tugas berikut:
 - a) Analisis dampak-dampak negatif dan positif kegiatan rehabilitasi dan operasi dan pemeliharaan jaringan irigasi terhadap lingkungan sosial ekonomi budaya.
 - b) Upaya-upaya pengelolaan dan pemantauan dampak-dampak negatif dan positif terhadap lingkungan sosial ekonomi budaya.

6) Tenaga Ahli Kesehatan Masyarakat (3 orang-bulan)

- o Tenaga ahli ini harus sarjana kesehatan masyarakat atau kesehatan lingkungan atau ilmu-ilmu terkait dengan bidang lingkungan yang memiliki pengalaman kerja minimal 6 tahun di bidang Amdal atau audit lingkungan.
- o Dia harus kompeten dalam pengumpulan dan analisis data rona lingkungan awal yang relevan dengan analisis dampak.
- o Dia akan bertanggungjawab terhadap tugas-tugas berikut:
 - a) Analisis dampak-dampak negatif dan positif kegiatan rehabilitasi dan operasi dan pemeliharaan jaringan irigasi terhadap lingkungan kesehatan masyarakat.
 - b) Upaya-upaya pengelolaan dan pemantauan dampak-dampak negatif dan positif terhadap lingkungan kesehatan masyarakat.

Persyaratan penyusun DELH: a) memiliki sertifikat kompetensi auditor lingkungan Hidup, b) memiliki sertifikat kompetensi penyusun dokumen Amdal, c) memiliki sertifikat kelulusan pelatihan penyusun Amdal; dan/atau d) memiliki sertifikat kelulusan pelatihan Auditor Lingkungan Hidup.

Keterkaitan isu-isu lingkungan dan K3 dengan tugas masing-masing tenaga ahli secara rinci, sebagaimana ditabulasikan pada Tabel 9.

c. Uraian Tugas Asisten Tenaga Ahli dan Tenaga Pendukung

1) Asisten Tenaga Ahli Lingkungan (9 orang-bulan)

- o Asisten Tenaga Ahli Lingkungan harus sarjana ilmu lingkungan atau ilmu-ilmu terkait dengan bidang lingkungan yang memiliki pengalaman kerja minimal 3 tahun di bidang Amdal atau audit lingkungan.
- o Dia harus kompeten untuk membantu tenaga ahli yang bersangkutan dalam pengumpulan dan analisis data rona lingkungan awal yang relevan dengan analisis dampak lingkungan hidup.
- o Dia bertanggungjawab membantu tugas-tugas Tenaga Ahli Lingkungan.

2) Asisten Tenaga Ahli Keselamatan dan Kesehatan Kerja (9 orang-bulan)

- Asisten Tenaga Ahli Keselamatan dan Kesehatan Kerja harus sarjana ilmu-ilmu terkait dengan bidang keselamatan dan kesehatan kerja yang memiliki pengalaman kerja minimal 3 tahun di bidang Amdal atau audit lingkungan.
- Dia harus kompeten untuk membantu tenaga ahli yang bersangkutan dalam pengumpulan dan analisis data rona lingkungan awal yang relevan dengan analisis dampak lingkungan hidup.
- Dia bertanggungjawab membantu tugas-tugas Tenaga Ahli Keselamatan dan Kesehatan Kerja.

3) Asisten Tenaga Ahli Fisik Kimia dan Biologi (9 orang-bulan)

- Asisten Tenaga Ahli Fisik Kimia dan Biologi harus sarjana ilmu-ilmu fisika, kimia dan biologi atau ilmu-ilmu terkait dengan bidang lingkungan yang memiliki pengalaman kerja minimal 3 tahun di bidang Amdal atau audit lingkungan.
- Dia harus kompeten untuk membantu tenaga ahli yang bersangkutan dalam pengumpulan dan analisis data rona lingkungan awal yang relevan dengan analisis dampak lingkungan hidup.
- Dia bertanggungjawab membantu tugas-tugas Tenaga Ahli Keselamatan dan Kesehatan Kerja.

4) Asisten Tenaga Ahli Sosial Ekonomi dan Budaya (9 orang-bulan)

- Asisten Tenaga Ahli Sosial Ekonomi dan Budaya harus sarjana ilmu sosial-ekonomi dan ilmu sosial-budaya atau ilmu-ilmu terkait dengan bidang sosial ekonomi budaya yang memiliki pengalaman kerja minimal 3 tahun di bidang Amdal atau audit lingkungan.
- Dia harus kompeten untuk membantu tenaga ahli yang bersangkutan dalam pengumpulan dan analisis data rona lingkungan awal yang relevan dengan analisis dampak lingkungan hidup.
- Dia bertanggungjawab membantu tugas-tugas Tenaga Ahli Sosial Ekonomi dan Budaya.

5) Asisten Tenaga Ahli Kesehatan Masyarakat (9 orang-bulan)

- Asisten Tenaga Ahli Kesehatan Masyarakat harus sarjana kesehatan masyarakat atau kesehatan lingkungan atau ilmu-ilmu terkait dengan bidang lingkungan yang memiliki pengalaman kerja minimal 3 tahun di bidang Amdal atau audit lingkungan.
- Dia harus kompeten untuk membantu tenaga ahli yang bersangkutan dalam pengumpulan dan analisis data rona lingkungan awal yang relevan dengan analisis dampak lingkungan hidup.
- Dia bertanggungjawab membantu tugas-tugas Tenaga Ahli Kesehatan Masyarakat.

6) Operator Komputer (3 orang -bulan)

- Operator Komputer minimal harus lulusan SMA/SMK atau yang sederajat yang memiliki pengalaman kerja sebagai operator komputer minimal 3 tahun di proyek-proyek sejenis.
- Dia harus kompeten untuk membantu tim dalam pengetikan/penyelesaian laporan-laporan dengan komputer.

- 7) Administrasi/Keuangan (3 orang -bulan)
- o Administrasi/keuangan minimal harus lulusan SMA/SMK atau yang sederajat yang memiliki pengalaman kerja sebagai tenaga administrasi atau keuangan minimal 3 tahun di proyek-proyek sejenis.
 - o Dia harus kompeten untuk membantu tim dalam penyelesaian administrasi/keuangan.
- 8) Surveyor (9 orang -bulan)
- o Surveyor minimal harus lulusan SMA/SMK atau yang sederajat yang memiliki pengalaman kerja sebagai surveyor minimal 3 tahun di proyek-proyek sejenis.
 - o Dia bertanggungjawab membantu tugas-tugas tenaga ahli dalam pengumpulan data dan informasi primer dan sekunder bidang Amdal.
- 9) Drafter/Operator CAD (4,5 orang -bulan)
- o Drafter/Operator CAD minimal harus lulusan SMA/SMK atau yang sederajat yang memiliki pengalaman kerja sebagai drafter/operator CAD minimal 3 tahun di proyek-proyek sejenis.
 - o Dia bertanggungjawab membantu tugas-tugas para tenaga ahli dalam penyajian dan penggambaran data dan informasi bidang Amdal ke dalam gambar-gambar desain dan peta-peta sesuai dengan kaidah kartografi.

9. Waktu Pelaksanaan dan Keluaran Analisis

a. Waktu Pelaksanaan Analisis

Waktu pelaksanaan pekerjaan mulai dari penyusunan laporan pendahuluan, survai hingga penyusunan laporan akhir adalah 90 (sembilan puluh) hari kalender.

b. Keluaran Analisis

Keluaran pekerjaan sebagaimana tersebut pada tabel dibawah ini harus diserahkan ke KPP Pengembangan Sistem Irigasi Way Sekampung selambat-lambatnya sembilan puluh (90) hari kalender sejak SPMK diterbitkan.

Tabel 8 - Jenis Dokumen yang harus diserahkan

No	Dokumen	Dokumen diterima/ pelatihan dilaksanakan (setelah SPMK)
1.	Laporan Pendahuluan Laporan berisi rencana kerja mulai persiapan, survai hingga penyelesaian laporan akhir DELH dan IEE dalam Bahasa Indonesia dan Bahasa Inggris. Jumlah laporan 5 buku dan 1 CD Rom	1 minggu
2.	Laporan Akhir a. Isi Laporan DELH sebagaimana yang disyaratkan di Permen KLHK Lampiran I Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor: P.102/MENLHK/ SETJEN/KUM.1/ 12/2016 dalam Bahasa Indonesia yang telah disetujui oleh Dinas Lingkungan Hidup Provinsi Lampung. b. Isi Laporan IEE sebagaimana yang disyaratkan di Annex to Appendix 1, Safeguard Policy Statement, ADB, 2009 dalam Bahasa Inggris yang telah disetujui oleh Tim Environmental and Social Safeguards ADB. Jumlah laporan masing-masing 5 buku dan 1 CD Rom	12 minggu
3.	Laporan Pelatihan tentang supervisi, pelaporan dan pemantauan Penyusunan Laporan Pelaksanaan RKL dan RPL sesuai dengan Keputusan Menteri Negara Lingkungan Hidup Nomor: 45 Tahun 2005 dalam Bahasa Indonesia yang telah disetujui oleh KPP Pengembangan Sistem Irigasi Way Sekampung Jumlah laporan 5 buku dan 1 CD Rom.	11 minggu
4.	Surat Keputusan (SK) DELH yang diterbitkan oleh Kepala Dinas Lingkungan Hidup Provinsi Lampung. Jumlah dokumen 1 asli dan 5 copy	12 minggu
5.	Izin Lingkungan yang diterbitkan oleh Gubernur Lampung. Jumlah dokumen 1 asli dan 5 copy	12 minggu

10. Sistematika Laporan

a. DELH

Isi DELH meliputi:

- 1) Pendahuluan
- 2) Kegiatan yang direncanakan
- 3) Kegiatan yang telah berjalan
- 4) Evaluasi dampak
- 5) Rencana pengelolaan dan pemantauan lingkungan hidup
- 6) Jumlah dan jenis izin perlindungan dan pengelolaan lingkungan hidup yang dibutuhkan
- 7) Pernyataan komitmen penanggung jawab kegiatan untuk melaksanakan ketentuan yang tercantum dalam DELH
- 8) Daftar pustaka dan
- 9) Lampiran.

Catatan: Penyusunan DELH menggunakan format laporan yang tercantum dalam Lampiran I Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor: P.102/MENLHK/SETJEN/KUM.1/12/2016.

b. IEE

Isi IEE meliputi:

- A. Executive Summary
- B. Policy, Legal, and Administrative Framework
- C. Description of the Project
- D. Description of the Environment (Baseline Data)
- E. Anticipated Environmental Impacts and Mitigation Measures
- F. Analysis of Alternatives
- G. Information Disclosure, Consultation, and Participation
- H. Grievance Redress Mechanism
- I. Environmental Management Plan
- J. Conclusion and Recommendation

Sumber: Annex to Appendix 1, Safeguard Policy Statement, ADB, 2009

c. Laporan Pelatihan

Isi Laporan Pelatihan minimum mencakup:

- a. Tujuan pelatihan
- b. Waktu dan tempat pelatihan
- c. Kualifikasi dan jumlah peserta
- d. Materi pelatihan
- e. Hasil pelatihan
- f. Kesimpulan dan saran
- g. Lampiran
 - Daftar hadir peserta pelatihan
 - Materi pelatihan (*power point*)
 - Dokumentasi pelaksanaan pelatihan.

Tabel 9 - Keterkaitan Isu-Isu Lingkungan dan K3 dengan Tugas Tenaga Ahli

No	Isu-Isu Lingkungan, Keselamatan dan Kesehatan Kerja dan Masyarakat, dan Pelaporan	Tenaga Ahli				
		Ketua Tim/Lingkungan	Keselamatan dan Kesehatan Kerja	Fisik Kimia	Biologi	Sosial Ekonomi dan Budaya
I	Penentuan lokasi proyek					
1)	Keberadaan lokasi proyek terhadap daerah sensitif lingkungan/kawasan lindung (berdekatan dengan atau di dalam):					
	a. Kawasan Lindung: Taman Nasional Way Kambas	√				√
	b. Kawasan Lindung:.....	√				√
	c. Lahan Basah (Rawa-rawa)	√				√
	d. Bakau	√				√
	e. Muara	√				√
	f. Zona penyangga Kawasan Lindung	√				√
	g. Daerah khusus untuk perlindungan keanekaragaman hayati	√				√
II	Tahap Rehabilitasi/Konstruksi					
a.	Persiapan Rehabilitasi/Konstruksi					
2)	Keresahan / kecemburuan sosial tenaga kerja lokal.	√				√
3)	Konflik sosial terkait tenaga kerja, jika tenaga kerja yang diterima dari luar daerah.	√				√
4)	Penurunan kualitas udara dan peningkatan kebisingan akibat pengoperasian <i>base camp</i> /barak kerja.	√			√	
5)	Penurunan kualitas udara dan peningkatan kebisingan akibat pembersihan lahan saluran	√			√	
b.	Pelaksanaan Rehabilitasi/ Konstruksi					
6)	Peningkatan kebisingan, karena pengoperasian peralatan konstruksi.	√		√	√	√

No	Isu-Isu Lingkungan, Keselamatan dan Kesehatan Kerja dan Masyarakat, dan Pelaporan	Tenaga Ahli					
		Ketua Tim/Lingkungan	Keselamatan dan Kesehatan Kerja	Fisik Kimia	Biologi	Sosial Ekonomi dan Budaya	Kesehatan Masyarakat
7)	Peningkatan kadar debu, karena pengoperasian peralatan konstruksi.	√		√	√	√	
8)	Kemacetan lalu lintas, akibat transportasi pengangkutan puing lapisan saluran dan sedimen ke tempat penimbunan.	√	√			√	
9)	Hambatan-hambatan untuk pergerakan/perpindahan/mobilisasi manusia dan hewan.	√	√			√	
10)	Erosi tanah sebelum pematatan dan pelapisan/pemasangan beton pracetak, akibat pematatan dan pelapisan/pemasangan beton pracetak.	√					
III	Tahap Operasi & Pemeliharaan (Audit)						
1)	Hilangnya nilai-nilai ekologi yang berharga, karena keberadaan jalan inspeksi yang menyebabkan perambahan ke hutan lindung, taman nasional, habitat satwa liar, rawa-rawa, dll. Atau bangunan / kawasan bersejarah / budaya, gangguan hidrologi saluran air alami, bahaya banjir dan drainase.	√		√	√	√	√
2)	Hambatan-hambatan untuk pergerakan/perpindahan/mobilisasi manusia dan hewan.	√	√			√	
3)	Penurunan debit aliran ekologi/aliran pemeliharaan pada musim kemarau ke Sungai Way Sekampung di hilir Bendung Argoguruh.	√			√	√	√
4)	Potensi masalah ekologi, karena meningkatnya erosi tanah dan pendangkalan yang menyebabkan penurunan kapasitas aliran air.	√			√	√	√
5)	Konflik dalam hak pasokan air terkait dengan konflik sosial.	√				√	
6)	Penurunan kualitas air di hilir dan oleh karena itu, penurunan penggunaan air yang bermanfaat di hilir.	√			√	√	√

No	Isu-Isu Lingkungan, Keselamatan dan Kesehatan Kerja dan Masyarakat, dan Pelaporan	Tenaga Ahli					
		Ketua Tim/Lingkungan	Keselamatan dan Kesehatan Kerja	Fisik Kimia	Biologi	Sosial Ekonomi dan Budaya	Kesehatan Masyarakat
7)	Pengurangan pasokan air di hilir selama musim puncak.	√				√	√
8)	Intrusi air laut ke dalam sistem air tawar di hilir.	√		√	√	√	√
9)	Drainase yang tidak mencukupi/memadai yang menyebabkan terjadinya intrusi salinitas.	√			√		
10)	Dampak yang tidak proporsional terhadap penduduk miskin, perempuan dan anak-anak, penduduk asli atau kelompok rentan lainnya.	√				√	√
11)	Penggenangan air permanen (<i>waterlogging</i>) dan salinisasi tanah, karena tidak memadainya drainase dan pengelolaan pertanian.	√			√	√	
12)	Pencucian unsur hara dan perubahan karakteristik tanah, karena penggunaan air irigasi yang berlebihan.	√		√	√	√	√
13)	Polusi tanah dan limpasan air irigasi dan air tanah yang tercemar serta risiko terhadap kesehatan masyarakat, karena pemakaian pupuk dan pestisida yang berlebihan	√		√	√	√	√
15)	Penyumbatan saluran-saluran irigasi oleh gulma air (eceng gondok).	√		√	√	√	√
16)	Pengenalan/peningkatan kejadian penyakit yang berhubungan dengan air atau penyakit terkait air.	√			√	√	√
17)	Arus populasi (datangnya penduduk) dalam jumlah besar selama konstruksi dan operasi proyek yang menyebabkan peningkatan beban pada infrastruktur dan layanan-layanan (seperti pasokan air dan sistem sanitasi).	√			√	√	√
18)	Bahaya-bahaya menyangkut lingkungan kerja yang aman dan sehat, karena bahaya-bahaya fisik, kimia, dan biologi selama rehabilitasi/konstruksi dan operasi proyek.	√	√	√	√	√	√

No	Isu-Isu Lingkungan, Keselamatan dan Kesehatan Kerja dan Masyarakat, dan Pelaporan	Tenaga Ahli					
		Ketua Tim/Lingkungan	Keselamatan dan Kesehatan Kerja	Fisik Kimia	Biologi	Sosial Ekonomi dan Budaya	Kesehatan Masyarakat
19)	Risiko-risiko terhadap keselamatan dan kesehatan masyarakat, karena transportasi, penyimpanan, dan penggunaan dan / atau pembuangan bahan-bahan seperti bahan peledak, bahan bakar dan bahan kimia lainnya selama konstruksi dan operasi	√	√			√	
20)	Risiko-risiko keselamatan masyarakat, karena bahaya kecelakaan dan bahaya alam, terutama di mana elemen struktur atau komponen proyek (misalnya, bendung irigasi) dapat diakses oleh anggota masyarakat yang terkena dampak atau di mana kegagalan mereka dapat mengakibatkan cedera pada masyarakat selama konstruksi, operasi dan penonaktifan (<i>decommissioning</i>) proyek.	√	√			√	
21)	Kecukupan proses, seperti partisipasi, konsultasi, penyelesaian pengaduan dan penanganan dampak lingkungan hidup yang terkait dengan pelaksanaan proyek.	√				√	
22)	Peningkatan kemampuan lembaga pelaksana di bidang pengelolaan lingkungan hidup dengan pelatihan tentang supervisi, pelaporan, dan pemantauan pelaksanaan rencana pengelolaan lingkungan hidup.	√	√	√	√	√	√
23)	Pelaporan						
	Laporan Pendahuluan DELH dan IEE	√	√	√	√	√	√
	Laporan Akhir DELH dan IEE	√	√	√	√	√	√
	Laporan Pelatihan	√	√	√	√	√	√

11. Pekerjaan Sub-konsultan

a. Persyaratan Perusahaan Sub-konsultan

Perusahaan Sub-konsultan penyusun DELH dan IEE harus merupakan perusahaan yang telah memiliki Sertifikat Tanda Registrasi Kompetensi Lembaga Penyedia Jasa Penyusun Dokumen Amdal dari Kementerian Lingkungan Hidup dengan masa registrasi masih berlaku atau belum berakhir.

b. Persyaratan Laboratorium

Laboratorium pelaksana pengukuran dan analisa kualitas air termasuk salinitas, kualitas udara dan tingkat kebisingan, kualitas tanah serta plankton dan benthos harus merupakan laboratorium rujukan yang terdaftar sebagai laboratorium lingkungan teregistrasi Kementerian Lingkungan Hidup dan Kehutanan dengan masa registrasi masih berlaku atau belum berakhir.

105°8'0" T

105°15'0" T

105°22'0" T

105°29'0" T

105°36'0" T

No	No. Sampel	Lokasi	KECAMATAN	DESA	Koordinat (m)	
					X	Y
1	UB1	Rehabilitasi Sal. Primer BBk4-5	BUMI RATU NUBAN	SUKAJAWA	522117	9433047
2	UB2	Rehabilitasi Sal. Sekunder BSk	BUMI RATU NUBAN	SIDOKERTO	523508	9432775
3	UB3	Pemukiman	BUMI RATU NUBAN	SIDOKERTO	523068	9432293
4	UB4	Rehabilitasi Sal. Primer BPU20	SEPUTH RAMAN	REJO ASRI	536792	9451554
5	UB5	Rehabilitasi Sal. Sekunder BG	KOTA GAJAH	SUMBER REJO	535296	9445913
6	UB6	Pemukiman	KOTA GAJAH	SUMBER REJO	534347	9445166
7	UB7	Rehabilitasi Sal. Primer BRB1	SEPUTH BANYAK	SUMBER BAHAGIA	545436	9461396
8	UB8	Rehabilitasi Sal. Primer BRB8-9	SEPUTH BANYAK	TANJUNG HARAPAN	551206	9464420
9	UB9	Pemukiman	SEPUTH BANYAK	TANJUNG HARAPAN	550665	9464579
10	UB10	Rehabilitasi Sal. Primer G2-G3	PURBOLINGGO	TAMAN CARI	554058	9447221
11	UB11	Rehabilitasi Sal. Sekunder TP	PURBOLINGGO	TAMAN FAJAR	556301	9449474
12	UB12	Pemukiman	PURBOLINGGO	TAMAN CARI	553911	9446979
13	UB13	Rehabilitasi Sal. Primer BRU9	BATANGHARI NUBAN	SUKARAJA NUBAN	546756	9446092
14	UB14	Rehabilitasi Sal. Sekunder BA	BATANGHARI NUBAN	TRISNO MULYO	543219	9445279
15	UB15	Pemukiman	BATANGHARI NUBAN	CEMPaka NUBAN	544185	9446721
16	UB16	Rehabilitasi Sal. Primer KB3-KB4	METRO TIMUR	YOSODADI	535560	9435278
17	UB17	Rehabilitasi Sal. Sekunder KBM	PEKALONGAN	SIRAMAN	541143	9437845
18	UB18	Pemukiman	METRO TIMUR	YOSODADI	536053	9435282
19	UB19	Rehabilitasi Sal. Primer KBH4-KBH5	METRO BARAT	MULYOSARI	530391	9429783
20	UB20	Rehabilitasi Sal. Sekunder KDJ	BATANGHARI	ADI WARNO	539308	9429516
21	UB21	Pemukiman	BATANGHARI	SUMBER REJO	537947	9430663

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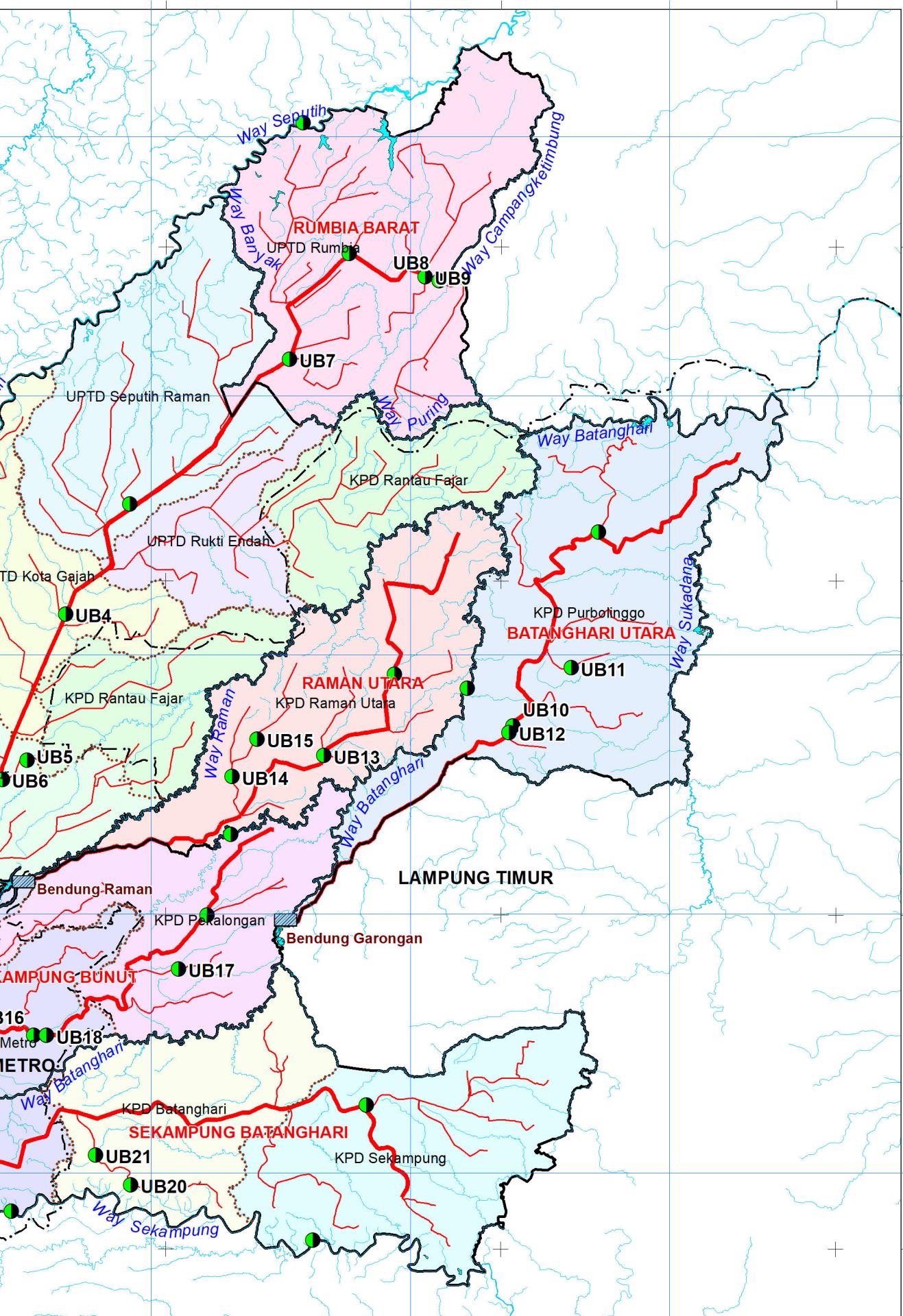
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Percepatan Penyediaan Infrastruktur melalui Jasa Teknik (ESP)

Perusahaan Konsultan Penyiapan Proyek (KPP) untuk Pengembangan Sistem Irrigasi Way Sekampung



KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL SUMBER DAYA AIR
DIREKTORAT IRIGASI DAN RAWA
Jl. Pattimura 20, Kebayoran Baru, Jakarta Selatan - 12110

LOKASI PENGAMBILAN SAMPEL KUALITAS UDARA & KEBISINGAN DAERAH IRIGASI WAY SEKAMPUNG

U
B
S
T
Skala 1:200.000
0 1,25 2,5 5 7,5 10 Km

Proyeksi : UTM Zona 48S
Sistem Grid : Grid Geografi and Grid UTM
Datum Horizontal : WGS 84
Datum Vertikal : Muka air laut setempat

LEGENDA

- Bendung
- Lokasi Pengambilan Sampel Kualitas Udara & Kebisingan
- - - Batas Kabupaten
- Batas UPTD
- ↑ Sungai
- Saluran Feeder
- Saluran Primer
- Saluran Sekunder
- Sub-daerah irrigasi

INSET PETA

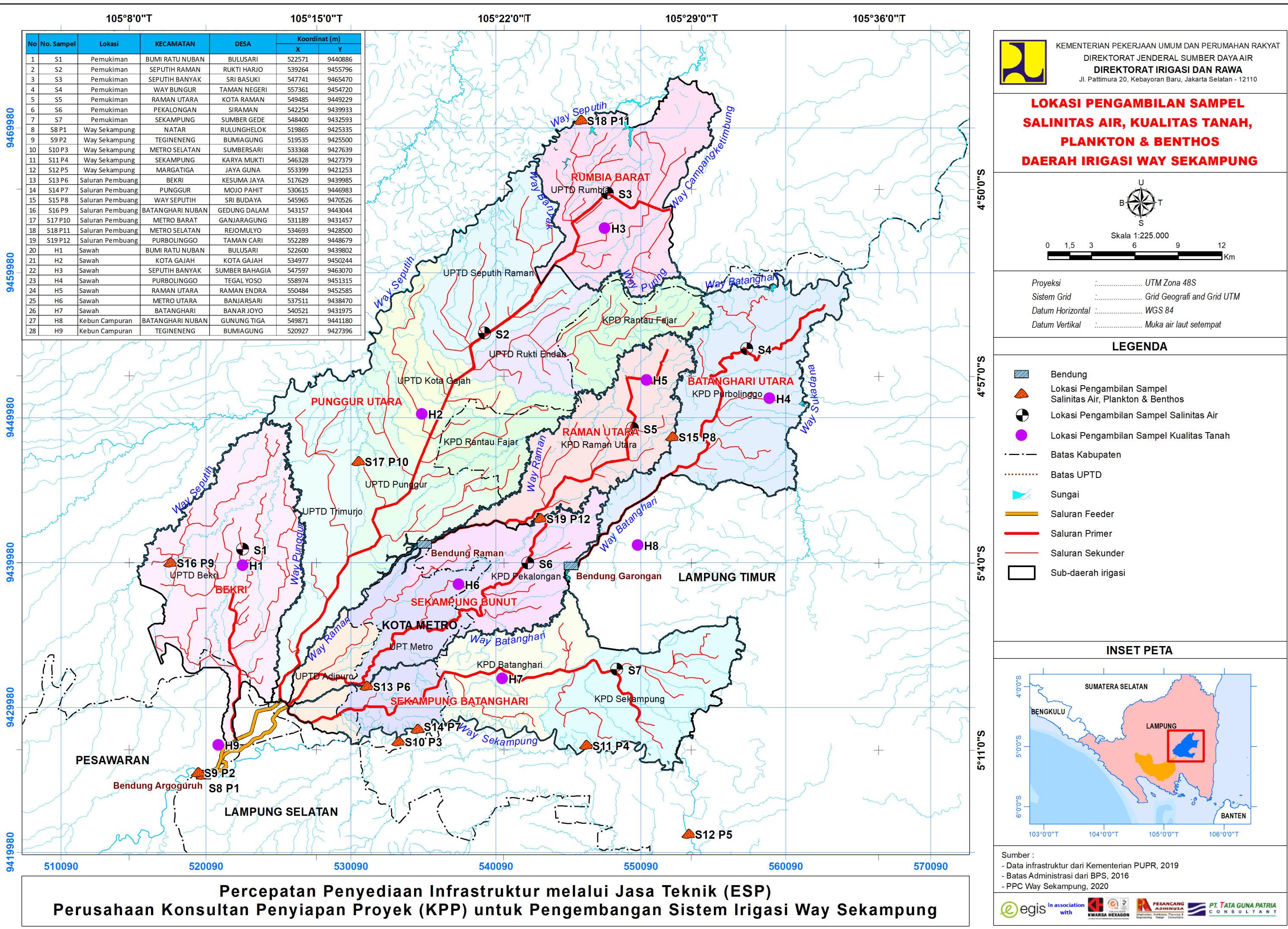


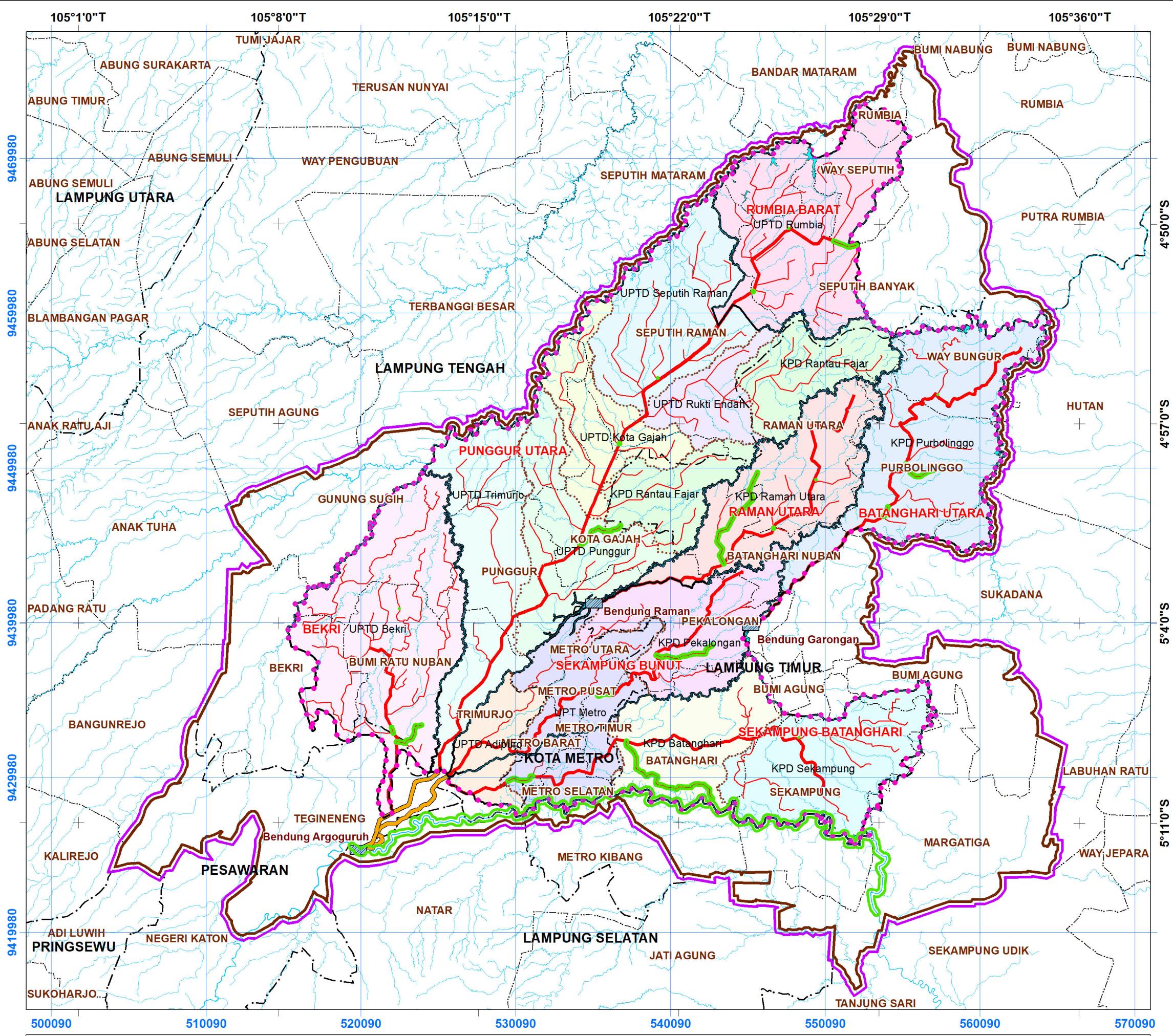
Sumber :

- Data infrastruktur dari Kementerian PUPR, 2019
- Batas Administrasi dari BPS, 2016
- PPC Way Sekampung, 2020



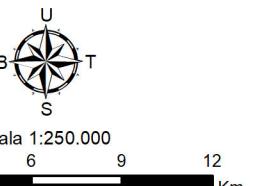
PERANCANG ADHIKUSA
KWARSA HEXAGON
Surveyors, Architects, Planning & Engineering
PT. TATA GUNA PATRIA
CONSULTANT





KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
DIREKTORAT JENDERAL SUMBER DAYA AIR
DIREKTORAT IRIGASI DAN RAWA
Jl. Pattimura 20, Kebayoran Baru, Jakarta Selatan - 12110

BATAS WILAYAH ANALISIS DAERAH IRIGASI WAY SEKAMPUNG



Proyeksi : UTM Zona 48S
Sistem Grid : Grid Geografi and Grid UTM
Datum Horizontal : WGS 84
Datum Vertikal : Muka air laut setempat

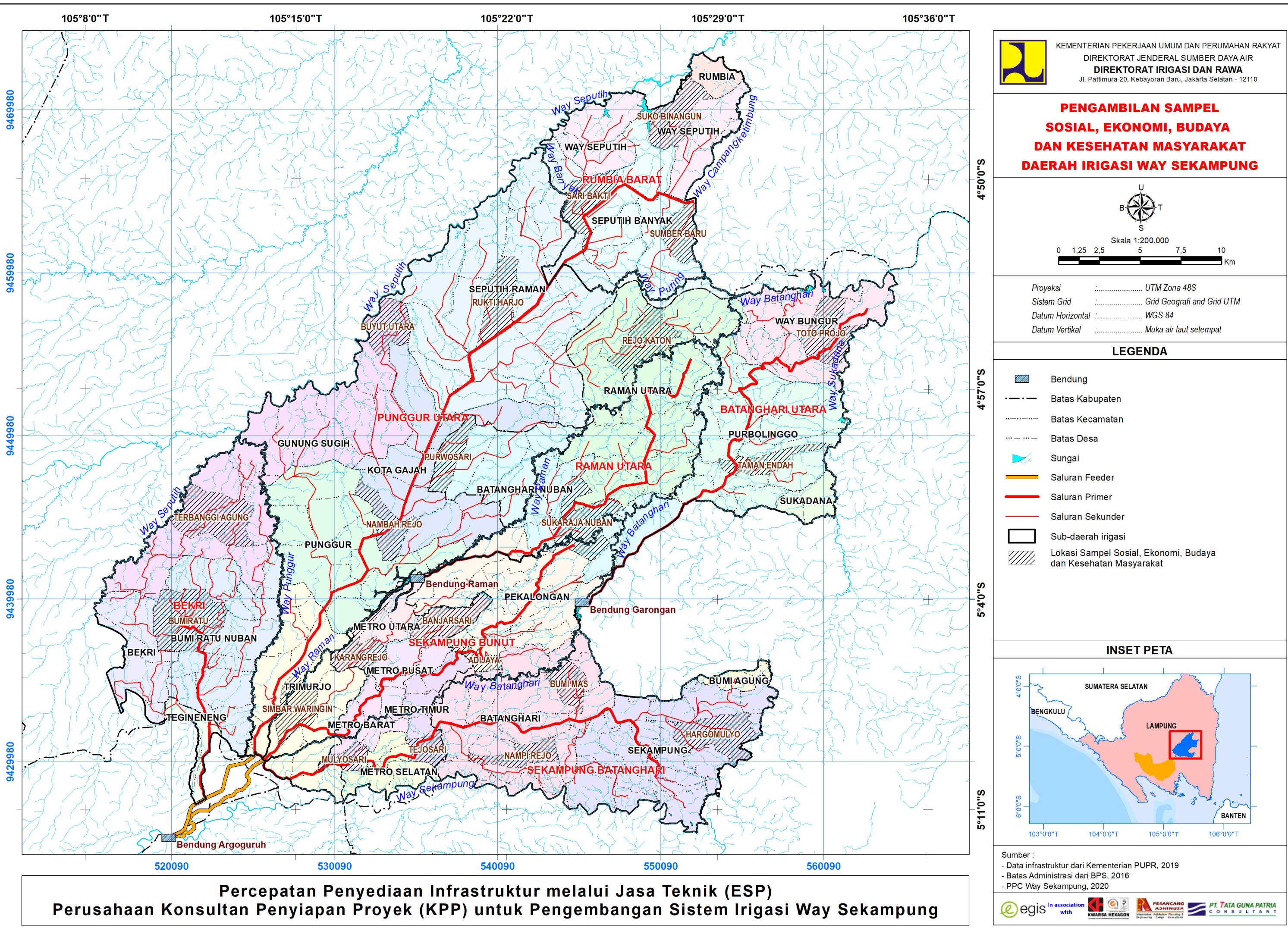
LEGENDA

- Bendung
- Batas Kecamatan
- - - - - Batas Kabupaten
- Batas UPTD
- ▲ Sungai
- Saluran Feeder
- Saluran Primer
- Saluran Sekunder
- Sub-daerah irigasi
- Batas Proyek
- Batas Ekologi
- Batas Sosial
- Batas Administrasi
- Batas Wilayah Analisis

INSET PETA



Sumber :
- Data infrastruktur dari Kementerian PUPR, 2019
- Batas Administrasi dari BPS, 2016
- PPC Way Sekampung, 2020



105°8' T E

105°15' T E

105°22' T E

105°29' T E

105°36' T E

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No	No. Sampel	Lokasi	Desa	Kecamatan	Koordinat (m)	
					X	Y
1	AS-1	Way Sekampung	Rulung Helok	Natar	519865	9425335
2	AS-2	Way Sekampung	Bumi Agung	Tegineneng	519535	9425500
3	AS-5	Saluran Pembuang	Sri Budaya	Way Seputih	549155	9470408
4	AS-7	Saluran Pembuang	Ganjaragung	Metro Barat	531029	9431843
5	AS-9	Saluran Pembuang	Trisno Mulyo	Batanghari Nuban	542278	9445113
6	AS-12	Way Sekampung	Jaya Guna	Marga Tiga	553028	9422348
7	AIP-1	Saluran Irigasi	Toto Katon	Punggur	530531	9440632
8	AIP-2	Saluran Irigasi	Sari Bakti	Seputih Banyak	545354	9463409
9	AIP-3	Saluran Irigasi	Hadi mulyo Barat	Metro Pusat	533719	9435078
10	AIS-5	Saluran Irigasi	Rejo Asri	Seputih Raman	539134	9453415
11	AIS-7	Saluran Irigasi	Sari Bakti	Seputih Banyak	545302	9465250
12	AIS-8	Saluran Irigasi	Sidodadi	Pekalongan	539369	9437512
13	AT-1	Air Tanah	Bulusari	Bumi Ratu Nuban	522571	9440886
14	AT-2	Air Tanah	Rukti Harjo	Seputih Raman	539264	9455796
15	AT-3	Air Tanah	Sri Basuki	Seputih Banyak	547741	9465470
16	AT-4	Air Tanah	Taman Negeri	Way Bungur	557361	9454720
17	AT-5	Air Tanah	Kota Raman	Raman Utara	549485	9449229
18	AT-6	Air Tanah	Siraman	Pekalongan	542254	9439933
19	AT-7	Air Tanah	Sumber Gede	Sekampung	548400	9432593

LAMPUNG TENGAH**PUNGGUR UTARA****BATANGHARI UTARA****RAMANUTARA****SEKAMPUNG BUNUT****SEKAMPUNG BATANGHARI****METRO****UPTD Adipuro****PESAWARAN****LAMPUNG SELATAN**

9459980

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4°50'0"S

4°57'0"S

5°4'0"S

5°11'0"S

520090

530090

540090

550090

560090



KEMENTERIAN PEKERJAAN UMUM DAN PERUMAHAN RAKYAT
 DIREKTORAT JENDERAL SUMBER DAYA AIR
 DIREKTORAT IRIGASI DAN RAWA
 Jl. Pattimura 20, Kebayoran Baru, Jakarta Selatan - 12110

**LOKASI PENGAMBILAN SAMPEL
 KUALITAS AIR PERMUKAAN & AIR TANAH
 DAERAH IRIGASI WAY SEKAMPUNG**



Skala 1:200.000

0 1,25 2,5 5 7,5 10 Km

Proyeksi : UTM Zona 48S
 Sistem Grid : Grid Geografi and Grid UTM
 Datum Horizontal : WGS 84
 Datum Vertikal : Muka air laut setempat

LEGENDA

- Bendung
- Lokasi Pengambilan Sampel Kualitas Air Permukaan
- Lokasi Pengambilan Sampel Kualitas Air Tanah
- Batas Kabupaten
- Batas UPTD
- Sungai
- Saluran Feeder
- Saluran Primer
- Saluran Sekunder
- Sub-Daerah Irrigasi

INSET PETA**Sumber :**

- Data Infrastruktur dari Kementerian PUPR, 2019
- Batas Administrasi dari BIG
- PPC Way Sekampung, 2020



In association with



PERANCANG ADHIKUSA
 Infrastructure, Architecture, Planning &
 Engineering, Design, Consultancy



Percepatan Penyediaan Infrastruktur melalui Jasa Teknik (ESP)

Perusahaan Konsultan Penyiapan Proyek (KPP) untuk Pengembangan Sistem Irrigasi Way Sekampung