LAMPIRAN-LAMPIRAN
Lampiran 1 PDRB Kabupaten Kepulauan Sangihe atas dasar harga berlaku menurut lapangan usaha

<table>
<thead>
<tr>
<th>Lapangan Usaha</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
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<tbody>
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PDRB                              | 709,625.00 | 803,731.40 | 896,739.65 | 1,049,339.43 | 1,231,153.30 |

Sumber: Sangihe dalam Angka (2010), Badan Pusat Statistik Kabupaten Kepulauan Sangihe
Lampiran 2 PDRB Kabupaten Kepulauan Sangihe atas dasar harga konstan menurut lapangan usaha

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<th>2008</th>
<th>2009</th>
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Lampiran 3 PDRB Provinsi Sulawesi Utara atas dasar harga konstan

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<th>2009</th>
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<td>315,994</td>
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Sumber: Badan Pusat Statistik Provinsi Sulawesi Utara (2010)
### Lampiran 4 Perhitungan nilai sektoral dibagi dengan jumlah PDRB Kabupaten Kepulauan Sangihe (Ei/Ei)

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Lampiran 9  Perhitungan untuk menentukan koefisien penduga dengan pemecahan *microsoft excel* untuk kelompok ikan pelagis kecil dengan metode CYP

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### TAHUN | EFFORT | CPUE | ET+1 | LNT+1 | ET+(ET+1) |
Lampiran 11 Perhitungan nilai \( r, q \) dan \( K \) untuk kelompok ikan pelagis kecil

\[
\begin{align*}
\alpha &= 0.2749318 \\
\beta_1 &= 0.2746419 \\
\beta_2 &= -0.0000579 \\
q &= \beta_2 (2 + r) \\
r &= \beta_1 + 1 = 1.2746419 \\
q &= \frac{1}{\beta_1} = 0.7253581 \\
1 - \beta_1 &= 0.2746419 \\
2 (1 - \beta_1) &= 1.4507162 \\
r &= 1.138136288
\end{align*}
\]

Lampiran 12 Perhitungan nilai \( r, q \) dan \( K \) untuk ikan pelagis besar

\[
\begin{align*}
\alpha &= 0.230630789 \\
\beta_1 &= 0.083613202 \\
\beta_2 &= -0.000207236 \\
q &= \beta_2 (2 + r) \\
r &= \beta_1 + 1 = 1.083613202 \\
q &= 0.916386798 \\
2 (1 - \beta_1) &= 1.832773596 \\
r &= 1.691354067
\end{align*}
\]
Lampiran 13 Maple analitik fungsi produksi ikan pelagis kecil

**FUNGSI GOMPERTZ**

```maple
restart;
r := 1.138136;
q := 0.000181698;
K := 8040.074;

f(x) := r*x*ln(K/x);

h := q*x*E;
g := solve(f(x) = h, x);
y := q*E*(K*exp(-q/r*E));
```

**FUNGSI LOGISTIK**

```maple
f(x) := r*x*(1-x/K);
h := q*x*E;
g := solve(f(x) = h, x);
y := q*E*(K*(1-q/r*E));
```
Lampiran 14 Maple analitik fungsi produksi ikan pelagis besar

**FUNGSI GOMPERTZ**

```maple
> restart;
> r := 1.691354; q := 0.0007649; K := 1681.3185;

\[ r := 1.691354 \]
\[ q := 0.0007649 \]
\[ K := 1681.3185 \]

\[ f(x) := r \times x \times \log(K/x) \]

\[ h := q \times x \times E \]

\[ g := \text{solve}(f(x) = h, x) \]

\[ y := q \times E \times (K \times \exp(-q/r \times E)) \]
```

**FUNGSI LOGISTIK**

```maple
> f := r * x * (1 - x/K);

\[ f(x) := r \times x \times (1 - x/K) \]

\[ h := q \times x \times E \]

\[ g := \text{solve}(f(x) = h, x) \]

\[ y := q \times E \times (K \times (1 - q/r \times E)) \]
```

---

1. Diatur Cara Dibedah Ulang Ulang
2. Dibedah Ulang Ulang
3. Penggunaan Hal yang Diterapkan
4. Pengembangan yang Diterapkan
5. Pengembangan Hal yang Diterapkan
6. Pengembangan Hal yang Diterapkan
### Lampiran 15 Proses perhitungan produksi lestari ikan pelagis kecil

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Lampiran 16 Proses perhitungan produksi lestari ikan pelagis besar

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**SUMMARY OUTPUT**

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| Multiple R | 0.872357854 |
| R Square   | 0.761008226 |
| Adjusted R Square | 0.641512339 |
| Standard Error | 0.041499977 |

Observations: 4

**ANOVA**

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**Lower 95%**

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Lampiran 24 Maple analitik pengelolaan optimal ikan pelagis kecil pada discount rate berbeda

Pengelolaan pada market discount rate 15%

```
restart;

> r := 1.138136; q := 0.000181698; K := 8040.074; c := 0.6203; p := 4.538; i := 0.15;

> f(x) := r*ln(K/x)-r+(c*r*ln(K/x))/(x*(p*q*x-c)) = i;

> X := solve(f(x), x);
```

```
f'(x) := 1.138136 ln \frac{8040.074}{x} - 1.138136 \\
+ \frac{0.7059857608*ln(8040.074/x)}{x}(0.000824545524 - 0.6203) = 0.15
```

```
> g(x) := ln(K/x)-1-(i/r)+(c*r)/(p*q*x)+(c*i)/(p*q*r*x) = 0;

> a := fsolve(g(x), x);

> optx := a;
```

```
h := r*optx*ln(K/optx);

> E := h/(q*optx);
```

```
G := q*K*y*exp \left( \frac{-q}{r} \right) y;
```

```
plot(G, y = 0 .. 35000;
```
2. Pengelolaan pada real discount rate 4.94%:

\[ r = 1.138136; q = 0.00018169; K = 8040.074; c = 0.6203; p = 4.538; i = 0.0494; \]

\[ f(x) = \ln(K/x) - 1 + (c*r*ln(K/x)/(x*(p*q*x-c))) = i; \]

\[ g(x) = \ln(K/x) - 1 - (i/r) + (c*r)/(p*q*x) + (c*i)/(p*q*r*x) = 0; \]

\[ \text{solve}(g(x), x); \]

\[ \text{restart;} \]

\[ r = 1.138136; q = 0.00018169; K = 8040.074; c = 0.6203; p = 4.538; i = 0.0494; \]
\[ a := \text{fsolve}(g(x), x); \]
\[ \text{optx} := a; \]
\[ h := r \cdot \text{optx} \cdot \ln(K/\text{optx}); \]
\[ E := h/(q \cdot \text{optx}); \]
Lampiran 25 Maple analitik pengelolaan optimal ikan pelagis besar pada *discount rate* berbeda

Pengelolaan pada *market discount rate* 15%

```maple
t> restart;
t> r := 1.691; q := 0.00076; K := 1681.32; c := 2.154; p := 9.287; i := 0.15;

f(x) := r*ln(K/x)-r+(c*r*ln(K/x)/(x*(p*q*x-c)))+i;
f := 1.691*ln(1681.32/x) - 1.691 + \frac{3.64241ln(1681.32/x)}{x(0.00705812x - 2.154)}

solve(f(x), x);

567.283718 t

r := 1.691;

q := 0.00076;

K := 1681.32;

c := 2.154;

p := 9.287;

i := 0.15;

f(x) := r*ln(K/x)-r+(c*r*ln(K/x)/(x*(p*q*x-c)))+i;

f := 1.691*ln(1681.32/x) - 1.691 + \frac{3.64241ln(1681.32/x)}{x(0.00705812x - 2.154)}

solve(f(x), x);

567.283718 t

g(x) := ln(K/x)-1-(i/r)+(c*r)/(p*q*x)+(c*i)/(p*q*r*x)=0;
g := ln(1681.32/x) - 1.08704908 + \frac{543.1310848}{x} = 0

a := fsolve(g(x), x);
a := 983.344802

> optx := a;

optx := 983.344802

> h := r*optx*ln(K/optx);
h := 891.903116

> E := h/(q*optx);
E := 1193.43360

> G := q*K*exp\left(-\frac{q}{r}\right)\cdot y;

G := 1.2778032e^{-0.0004494382022y}

plot(G, y = 0 .. 20000);
```
pengelolaan pada real discount rate 4.94%.

restart;

\[ r := 1.691; \quad q := 0.00076; \quad K := 1681.32; \quad c := 2.154; \quad p := 9.287; \quad i := 0.0494; \]

\[ f(x) := r \ln(K/x) - r + (c*r \ln(K/x)/(x*(p*q*x-c))) = i; \]

> \textbf{solve}(f(x),x);

\[ h := r*\text{optx} \ln(K/\text{optx}); \]

\[ E := h/(q*\text{optx}); \]
Lampiran 26 Maple analitik untuk rezim pengelolaan perikanan di Kepulauan Sangihe

PERIKANAN PELAGIS KECIL

restart;

\[ r := 1.138136; \]
\[ q := 0.00018169; \]
\[ K := 8040.074; \]
\[ c := 0.6203; \]
\[ p := 4.538; \]
\[ i := 0.15; \]

\[ \text{hs} := q \times K \times E \times \exp\left(-\frac{q}{r} \times E\right); \]

\[ 1.460801045 \times E \exp\left(-0.0001596382155 \times E\right) \]

\[ \text{Emax} := \text{diff}(\text{hs}, E); \]

\[ 1.460801045 \exp(-0.0001596382155 \times E) - 0.0002331996720 \exp(-0.0001596382155 \times E) \]

\[ \text{Esus} := \text{solve}(\text{Emax} = 0, E); \]

\[ 6264.164235 \]

\[ \text{hsus} := q \times K \times \text{Esus} \times \exp\left(-\frac{q}{r} \times \text{Esus}\right); \]

\[ 3366.353542 \]

\[ \text{Xsus} := \frac{\text{hsus}}{q \times \text{Esus}}; \]

\[ 2957.777931 \]

\[ \text{pisus} := p \times \text{hsus} - c \times \text{Esus}; \]

\[ 11390.85130 \]

\[ \text{pi} := p \times \text{hsus} - c \times E; \]

\[ 6.629115142 \exp(-0.0001596382155 \times E) - 0.6203 \times E \]

\[ \text{Eoa} := \text{solve}(\text{pi} = 0, E); \]

\[ 0., 14839.95152 \]

\[ \text{Xoa} := c/(p \times q); \]

\[ 752.3263355 \]

\[ \text{hoa} := \text{Eoa} \times q \times \text{Xoa}; \]

\[ 0., 2028.475524 \]

\[ \text{Eopt} := \text{diff}(\text{pi}, E); \]

\[ 6.629115142 \exp(-0.0001596382155 \times E) - 0.001058260112 \exp(-0.0001596382155 \times E) - 0.6203 \]
Eopt := solve(Eopt = 0, E);
4968.542099

TR := p*hs;
6.629115142 E exp(-0.0001596382155 E)

TC := c*E;
0.6203 E

plot({TC, TR}, E = 0 .. 50000);

plot(hs, E = 0 .. 50000);

hopt := q*K*Eopt*exp(-q*Eopt/r);
3283.606000

Xopt := hopt/(q*Eopt);
3637.399825

phiopt := hopt*p-c*Eopt;
11819.01737

ERIKANAN PELAGIS BESAR

restart;

r:=1.69135406676228; q:=0.000764981; K:=1681.31856443672; c:=2.15410166555628;
p:=9.28689122547088; i:=0.15;

hs:=q*K*E*exp((-q/r)*E);
1.286176756 E exp(-0.0004522890948 E)

Emax := diff(hs, E);
1.286176756 E exp(-0.0004522890948 E)

Esus := solve(Emax = 0, E);
2210.975262
\[ h_{sus} := qK^*E_{sus} \exp(-q^*E_{sus}/r); \]

\[ X_{sus} := h_{sus}/(q^*E_{sus}); \]

\[ p_{sus} := p^*h_{sus} - c^*E_{sus}; \]

\[ \pi := p^*h - c^*E; \]

\[ E \exp(-0.0004522890948^E) - 2.15410166555628^E \]

\[ E_{oa} := \text{solve}(\pi = 0, E); \]

\[ 0., 3787.188695 \]

\[ X_{oa} := c/(p^*q); \]

\[ 303.2111651 \]

\[ h_{oa} := E_{oa}^q X_{oa}; \]

\[ 0., 878.4413729 \]

\[ E_{opt} := \text{diff}(\pi, E); \]

\[ 11.94458363 \exp(-0.0004522890948^E) - 0.005402404918^E \exp(-0.0004522890948^E) \\
- 2.15410166555628 \]

\[ E_{opt} := \text{solve}(E_{opt} = 0, E); \]

\[ 1444.605848 \]

\[ TR := p^*h; \]

\[ 11.94458363 \exp(-0.0004522890948^E) \]

\[ TC := c^*E; \]

\[ 2.15410166555628^E \]

\[ \text{plot}\{TC, TR\}, E = 0 .. 12000; \]

\[ \text{plot}(hs, E = 0 .. 12000); \]

\[ h_{opt} := q^*K^*E_{opt} \exp(-q^*E_{opt}/r); \]

\[ 966.6982364 \]

\[ X_{opt} := h_{opt}/(q^*E_{opt}); \]

\[ 874.7640145 \]

\[ p_{hopt} := h_{opt} - p^*c^*E_{opt}; \]

\[ 5865.793505 \]
Kuesioner untuk pedagang/nelayan yang melakukan kegiatan penyeludupan ke Filipina

IDENTITAS RESPONDEN
Nama:
Alamat:
Umur: ...................tahun
Pendidikan: SD/SMP/SLTA/Akademi/Perguruan Tinggi.
Pekerjaan: Petani/Nelayan/Buruh/Pedagang/Pengusaha
Pendapatan: Rp. ........................../bulan.
Jumlah anggota keluarga: .................orang

PERTANYAAN DAN/ATAU PERNYATAAN
1. Barang apa saja yang dibawa dari Indonesia ke Filipina:
2. Dari Filipina para "penyelundup" memasok barang ke Indonesia/Sangihe berupa:
   - Setiap trip melapor kepada petugas di Marore
   - Tidak sering melapor
   - Melapor kalau barang bawaan sedikit atau tidak melebihi ketentuan
   - Tidak pernah melapor

Bagaimana Bapak/Ibu dapat meloloskan diri dari pengamatan petugas.
   - Memberi tip/sogokan kepada petugas yang ada
   - Kerjasama dengan petugas di perbatasan
   - Mengelabui terlebih dahulu baru jalan

Jelaskan route perjalanan Bapak/Ibu apabila melakukan perdagangan yang tidak resmi tersebut.
7. Apakah Bapak/Ibu melakukan perkerjaan ini disebabkan kebutuhan dalam kehidupan atau memang pekerjaan yang telah ditekuni sejak dulu.
   - Kebutuhan ekonomi
   - Tidak ada pekerjaan lain
   - Mencari keuntungan berdagang

Berapa kali Bapak/Ibu melakukan perdagangan yang illegal ke Filipina.

Menurut Bapak/Ibu, berapa banyak orang yang melakukan kegiatan perdagangan illegal yang Bapak ketahui setiap bulannya.

8. Dalam melaksanakan kegiatan perdagangan yang illegal, apakah Bapak/Ibu menggunakan peralatan perahu/pamboat sendiri atau menyewa atau pemilik
   - Sebagai pemilik
   - Penyewa pamboat
   - Pekerja dalam pamboat tersebut
   - Penumpang yang membayar ongkos saja
   - Menitip uang untuk dilakukan pembelian barang di Filipina

9. Apakah Bapak/Ibu selama ini telah mengetahui atau pernah bermukim di Filipina
   - Ya
   - Tidak
   - Mempunyai kerabat di Filipina

10. Selain pekerjaan melakukan kegiatan perdagangan lintas batas, apakah Bapak/Ibu melakukan kegiatan sebagai nelayan
    - Tidak
    - Ya
    - Kadang-kadang
Lampiran 28 Data hasil turun lapang untuk responden P2K perbatasan

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Lampiran 29 Output Analisis Logit dengan Eviews

Dependent Variable: Y
Method: ML - Binary Logit (Quadratic hill climbing)
Date: 10/08/11   Time: 14:20
Sample: 1 32
Included observations: 32
Convergence achieved after 8 iterations
QML (Huber/White) standard errors & covariance

<table>
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<tr>
<th>Variable</th>
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<th>Std. Error</th>
<th>z-Statistic</th>
<th>Prob.</th>
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McFadden R-squared | 0.878380 | Mean dependent var | 0.718750 |
D. dependent var | 0.456803 | S.E. of regression  | 0.187807 |
Akaikes info criterion | 0.644516 | Sum squared resid    | 0.846518 |
Schwarz criterion | 1.010950 | Log likelihood       | -2.312259 |
Hannan-Quinn criter. | 0.765979 | Deviance             | 4.624518 |
Residual deviance  | 38.02432 | Restr. log likelihood | -19.01216 |
LR statistic      | 33.39980 | Avg. log likelihood  | -0.072258 |
Prob(LR statistic) | 0.000022 |

Obs with Dep=0   9  Total obs   32
Obs with Dep=1   23
A. GEOPOLITIK DAN HANKAM

1. Persoalan "tapal batas" Indonesia dan Filipina merupakan hal yang strategis dalam penetapan kedaulatan negara.


Perlu dikaji kembali tentang letak geografis untuk penentuan batas Nusa Utara.

Kedaulatan NKRI dalam hubungan antar negara memiliki arti penting bagi kemerdekaan.

Diperlukan peningkatan pendidikan untuk mempertinggi rasa nasionalisme.

Diperlukan perubahan paradigma terhadap pemahaman pembangunan terhadap Indonesia sebagai negara kepulauan.

Diperlukan kebijakan pembangunan yang memperhatikan aspek geografis.

Kondisi keamanan laut di daerah P2K perbatasan Indonesia memerlukan perhatian yang serius dari pemerintah.

Masalah perbatasan laut di daerah perbatasan seperti pulau-pulau kecil di perbatasan Indonesia dan Filipina diserahkan kepada TNI-AL dan POLRI sebagai kekuatan inti keamanan nasional di laut.


B. DAYA DUKUNG EKONOMI

P2K perbatasan Kepulauan Sangihe memiliki daya dukung ekonomi yang kuat apabila dikaji dari sisi wilayah Nusa Utara.

Daya dukung ekonomi yang dimiliki oleh Nusa Utara berupa perikanan, pariwisata bahari, dan perkebunan.

Daya dukung ekonomi akan memiliki kemanfaatan apabila disertai dengan transaksi ekonomi melalui sistem perdagangan.
Sistem perdagangan di P2K perbatasan akan dapat berkembang apabila didukung oleh pengembangan sarana dan prasarana transportasi laut. Perdagangan P2K perbatasan akan dapat berkembang apabila diorientasikan ke Filipina Selatan sebagai *outwardlooking system* dengan *backward linkage*. Sulawesi dan *forward linkage* Filipina.

Penataan hubungan antara Indonesia dan Filipina perlu diperluas tidak hanya *border crossing agreement* (BCA) yang telah ada tetapi perlu dikembangkan pada keseluruhan pulau kecil yang ada di Kabupaten Kepulauan Sangihe.

Untuk efektivitas dan efisiensi pengelolaan P2K Kabupaten Kepulauan Sangihe perlu adanya pergeseran paradigma dengan mengembangkan BCA ke arah BTA (*border trade agreement*).

Pengembangan dan pergeseran paradigma BCA ke BTA akan mendorong terjadinya pengawasan terhadap pemanfaatan sumber daya perikanan di P2K Perbatasan Kabupaten Kepulauan Sangihe.

Perubahan paradigma dari BCA ke BTA memerlukan suatu perubahan yang mendasar dalam pengelolaan pulau-pulau kecil perbatasan di Indonesia.

Menurut pengalaman, pengamatan dan apa yang Sdr ketahui, apakah P2K Perbatasan Kepulauan Sangihe sesuai bila dikembangkan sebagai kawasan industri perikanan dan perdagangan sebagai basis pertumbuhan wilayah (*growth center*).

Kawasan P2K Kabupaten Kepulauan Sangihe memiliki zona penangkapan ikan ikan (*fishing ground*) oleh karena itu berpotensi untuk dikembangkan menjadi kota pantai (*township*) berbasis industri perikanan.

Nilai dan jumlah barang yang diperdagangkan sebesar US$ 250 sebagaimana tercantum dalam BCA tidak perlu dipertahankan lagi sebes di kota Tahuna, Petta dan daerah sekitarnya bahkan sampai dengan Manado telah “dibanjiri” dengan barang-barang yang berasal dari Filipina baik secara legal maupun illegal.

Pembatasan nilai sebesar US$ 250 selama kurang lebih 35 tahun memberikan nuansa tidak pekarya para pengambil keputusan akan kehidupan masyarakat lokal di P2K Perbatasan Kabupaten Kepulauan Sangihe, sebab telah mengalami beberapa kali inflasi namun kebijakan tersebut menganut paham *fixed trade*.

Perubahan nilai *fixed trade* (US$ 250) diduga akan memperkecil terjadinya *illegal trade* antara pengusaha Indonesia khususnya pengusaha di Kabupaten Sangihe dengan mitra kerja di Filipina.

**DAYA DUKUNG LINGKUNGAN**

Pengelolaan berbasis daya dukung lingkungan sangat penting diperhatikan sebab posisi kawasan P2K perbatasan Kepulauan Sangihe terletak pada alur gunung berapi dengan struktur tanah cenderung labil.

Tingginya frekuensi bencana alam salah satu penyebabnya adalah pemanfaatan sumber daya alam tanpa mengindahkan kaidah-kaidah konservasi yang menyebabkan penurunan kualitas daya dukung lingkungan.