Well-being for Sato-Umi

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Fisheries Management Group
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里海

SATO-UMI
Harmony in Social Ecological Systems (SES)

“The good SATO UMI” based on the history and culture in Japan
Typical breakfast in Japan

- Seafood is consumed everyday in Japan.
- The 2nd largest source of total protein intakes, the largest source of animal protein intakes.
- Positive correlation btw rice consumption volume.
Ordinary life and Local food culture

Photo by Hirota (2014)
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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</thead>
</table>
| Q1 | Marine Sediment  
|  | Gravely sand  
|  | Bedrock  
|  | Shore reef  
|  | Seaweed bed  
|  | Muddy  
|  | blackwater  
|  | Mangrove  |
| Q2 | Coastal landform  
|  | Open sea  
|  | Gulf  
|  | Channel/Strait  
|  | Cove  
|  | Sandy beach  
|  | Tidal flat  
|  | Shoal  
|  | Coral reef  
|  | Reef  
|  | Ria coast  
|  | Archipelago  |
| Q3 | Geography of landing  
|  | Plain  
|  | Delta  
|  | Hill  
|  | Peninsular  
|  | Basin  
|  | Table land  
|  | Mountainous  
|  | Valley  
|  | Mountains pass  
|  | Alluvial fan  
|  | Beach  |
| Q4 | Fishing Gear  
| 1. Purse seiner (%)  
| 2. Trawl net (%)  
| 3. Diving (%)  
| 4. Long line (%)  
| 5. Hook (%)  
| 6. Large set net (%)  
| 7. Small set net (%)  
| 8. Bottom set net (%)  
| 9. Gillnet (%)  
| 10. Small trawl (%)  
| 11. Stick-held dip  |
| Q5 | Annual schedule  
| 1 2 3 4 5 6 7 8 9 10 11 12  |
| Q6 | Form of fishing vessel  
|  | Multi-purpose  
|  | Specialized  |
| Q7 | The number of labor  
| 2-3* (No)  
| 3-4 (No)  
| 7-8 (No)  
| 10-15 (No)  
| 15-20 (No)  
| 20-30 (No)  |
| Q8 | Operating capital from  
|  | Personal (No)  
|  | Fishers Group (No)  
|  | Official Bank (No)  
|  | Moneylender (No)  
|  | Fisheries Association (No)  
|  | Middleman (No)  
|  | Foreign capital (No)  
|  | Different industry (No)  |
| Q9 | Work form  
|  | Full-time (No)  
|  | Part-time (No)  
|  | Seasonal (No)  |
| Q10 | Fish category  
|  | Pelagic (%)  
|  | Dimersal (%)  
|  | Rock (%)  
|  | Crustaceans (shrimp, crab) (%)  
|  | Shellfish (%)  
|  | Squid (%)  |
| Q11 | Landing place  
|  | Private sector  
|  | Government sector  
|  | Free*  |
| Q12 | Working Capacity/Day  
|  | Freeze (4 t)  
|  | Primary (4 t)  
|  | Canning (t)  
|  | Fish sauce (t)  
|  | Dry-salt (Anchoy) (5 t)  
|  | Fish meal (3 t)  
|  | others (t)  
|  | Fresh (t)  
|  | Live (t)  
|  | Ice (5 t)  |

*family members  
*in front of house (Songkhla lake, beach)
Songkhla

Small-scale fisheries

Fresh (Ice) & Live

Fish, shrimp

Landing port (Beach, canal)

Very few

Middleman

Cu-kud fish landing group

Middleman

Individual processing (dry Anchovy, etc.)

Self

Local market

Super market/Restaurant

Export to:
- Malaysia, Singapore,
- Phatthalung, Hat Yai,
- Bangkok

Small pieces from processing will be for Fish meal (Ex. for a dug, etc.) and Fertilizer
WB-CUBE Analysis

Indonesia Survey (March, 2014)
1. Data Information
2. A restructuring of Well-Being elements model
3. Well-being CUBE analysis
4. Discussion
1. Bantaeng South Sulawesi (N=50)
2. Kaeawang West Java (N=50)
3. North Jakarta-Dki Jakarta (N=25)
4. Pekalongan Central Java (N=50)
5. Sorong West Papua (N=25)

TOTAL N=200

Thanks for all BPPT’s help!
We could get this data about HWB of the sea, using original questionnaire-paper.
Did a survey on “35CUBE-Pieces” by rating criteria the level of expectation! and satisfaction!

Q2: Please think about the level of satisfaction you feel toward the many aspects of sea. For example, utilizing and benefiting from the resources and nature of the sea, and how these serve you. Please rate each aspect according to the following.

Andaraskan anter hadap banyak aspek tentang laut. Misalnya, dalam menggunakan dan memanfaatkan sumber daya lautan, dan seberapa besar manfaatnya untuk anda. Berikanlah skala penilaian Anda berdasarkan aspek di bawah ini.

Ex: Healing: Sense of support, grounding and positivity
   5: Very satisfied / Sangat puas  [ 5 ]
   4: A little satisfied / Cukup puas  [ 4 ]
   3: Neither satisfied nor dissatisfied / antara puas dan tidak puas  [ 3 ]
   2: Dissatisfied / Tidak puas  [ 2 ]
   1: Very dissatisfied / sangat tidak puas  [ 1 ]

Please circle the number that accurately describes your answer!!

Lingkarilah jawaban yang mendingan akurat dalam jawaban anda.

Determine how your expectations in every aspect below
Tentukan seberapa besar harapan Anda pada setiap aspek di bawah ini

<table>
<thead>
<tr>
<th>NO</th>
<th>Aspect of Satisfaction</th>
<th>Rate of satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Healing: Sense of support, grounding and positivity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relaxation: Feel relieved and secure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aesthetics: Appreciation of beauty ex) music, pictures, and other favorite things</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stability: Live comfortably with something reliable or</td>
<td></td>
</tr>
</tbody>
</table>
The CUBE has 27 Pieces but we use **35 Pieces** for the purpose of getting completeness about human needs.

Did a survey on “35CUBE-Pieces” by rating criteria the level of **expectation**! and **satisfaction**!.
Background: Relationship amongst Ecosystems, Ecosystem Services, and Human Well-beings

(Millennium Ecosystem Assessment 2005)

We don't know how WB can be improved by the improved scientific knowledge on ecosystems and their services...

Human Well-Being

- Security
  - Basic material
    - For good life
- Health
- Good social relations
- Freedom of choice and action
Well-Being elements model
(security, basic material, health, and social relations)

1. A way of remodeling about ES-WB
2. The dependent variable was “ES-WB’s satisfaction data”

Is it parataxis??

<table>
<thead>
<tr>
<th>Human Well-Being</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security</td>
</tr>
<tr>
<td>Basic material</td>
</tr>
<tr>
<td>For good life</td>
</tr>
<tr>
<td>Health</td>
</tr>
<tr>
<td>Good social relations</td>
</tr>
<tr>
<td>Freedom of choice and action</td>
</tr>
</tbody>
</table>

?
MA_Well-Being MODEL
(country by country)

Indonesia n=200  Japan n=468
Korea n=540  USA n=556

χ²(4) = 29.899, p < .001, GFI = .993, AGFI = .900, CFI = .996, RMSEA = .061

β:***p < .001, **p < .01, *p < .05
ALL R² = p < .01
We used... INDONESIA DATA "Structural Equation Modeling"

【The dependent variable was MA's WB satisfaction LEVEL】

Security

Correlation ↓
A: .741***
SS: .571***
WJ: .863***
DJ: .547***
CJ: .528***
WP: .859***

Basic material for good life

VIF<10

Good social relationship
R² = A: .305***/①.157*/②.066 n.s. /③.354***/④.243***/⑤.558***

Health
R² = A: .722***/①.586***/②.591 /③.671*** /④.524***/⑤.899***

Fit the model

ALL n=200
①South Sulawesi n=50
②West Java n=50
③Dki Jakarta n=25
④Central Java n=50
⑤West Papua n=25

SEM
X²(1)=2.558, n.s., GFI=.995, AGFI=.924, CFI=.998, RMSEA=.088
Multiple group SEM
X²(4)=7.979, n.s., GFI=.984, AGFI=.765, CFI=.995, RMSEA=.055

SEM
Χ²(1)=2.558, n.s., GFI=.995, AGFI=.924, CFI=.998, RMSEA=.088
Multiple group SEM
Χ²(4)=7.979, n.s., GFI=.984, AGFI=.765, CFI=.995, RMSEA=.055
Indonesia
n=200

β: —p<.01, ---p<.05   ALL R²=p<.01
β:  p<.001, **p<.01, *p<.05   ALL R²=p<.01

Freedom of choice and Action
R²=.663

=β=path coefficient
"Structural Equation Modeling"

The dependent variable was MA’s WB satisfaction LEVEL

South Sulawesi n=50

Central Java n=50

Multiple group SEM

$X^2(4) = 7.979$, n.s., GFI = .984, AGFI = .765, CFI = .995, RMSEA = .055

**Strong relationships**

- Security
  - VIF < 10
  - Correlation $r = .571^{***}$
  - $\beta = .50$

- Good social relationship
  - $R^2 = .157^*$
  - $\beta = .304^{†}$
  - $\beta = .134$
  - $\beta = .748^{***}$

- Health
  - $R^2 = .586^{***}$
  - $\beta = .031$

- Freedom of choice and action
  - $R^2 = .594^{***}$
  - $\beta = .273^{*}$
  - $\beta = .503^{***}$

**Significance levels**

- *** $p < .001$
- ** $p < .01$
- * $p < .05$
- † $p < .10$
- n.s. not significant
We used INDONESIA DATA “Structural Equation Modeling”

The dependent variable was MA’s WB satisfaction LEVEL

Security

Good social relationship

Health

Freedom of choice and action

β=.224

β=.314

β=.178

β=.326†

β=.706***

β=.308

β=.642**

β=.354**

R²=.671***

β=.631***

R²=.631***

Correlation↓ DJ: r=.547***

VIF<10

Multiple group SEM

Χ²(4)=7.979, n.s., GFI=.984, AGFI=.765, CFI=.995, RMSEA=.055

Dki Jakarta n=25

物資の満足が健康の満足につながり選択と行動の自由へむかっている。安全・物資の満足は良い社会関係にはつながっていない。

***p<.001, **p<.01, *p<.05, †p<.10, n.s.
Constituents of Well-Being

Basic material for good life

◆ 34: 競争 / 15: 貢献 / 35: 食 （"E" R² = .565）
◆ 21: 同化 （"S" R² = .376）
Constituents of Well-Being

Health
◆ 34: 競争 / 15: 貢献 / 2: ー安心 / 19: 愛着 （"E" R² = .780）
◇ 12: 利益 / 1: くつろぎ / 4: ーゆとり / 7: 転換 / （"S" R² = .912）
We used INDONESIA DATA “Structural Equation Modeling”

The dependent variable was MA’s WB satisfaction LEVEL

Multiple group SEM
$X^2(4)=7.979, \text{n.s.}, \ GFI=.984, \ AGFI=.765, \ CFI=.995, \ RMSEA=.055$
Constituents of Well-Being

Good social relations

◆ 21: 同化 / 7: 転換 / 6: 一らしさ / 19: 愛着 （ “E” $R^2 = .670$ ）
We used... INDONESIA DATA “Structural Equation Modeling”

【The dependent variable was MA’s WB satisfaction LEVEL】

Security

Correlation↓
WP: \( r = 0.859^{***} \)

VIF<10

β=.619***

β=.241

β=.444***

β=.469***

Basic material for good life

Good social relationship

R²=.558***

Health

R²=.899***

Freedom of choice and action

R²=.793***

Multiple group SEM
\( X^2(4) = 7.979, \text{n.s.}, \text{GFI} = .984, \text{AGFI} = .765, \text{CFI} = .995, \text{RMSEA} = .055 \)

**p<.01, *p<.05, † p<.10, n.s.**

物資の満足は、良い社会関係に影響を与え、安全への満足度は健康の満足度を高めていた。そして、とくに健康の満足度が選択と行動の自由を支えていることが示された。
Constituents of Well-Being

Security

（"E" $R^2 = .945$


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<thead>
<tr>
<th>Energy</th>
<th>Development</th>
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-237 Aesthetics
-553 Impression
-553 Stability
-177 Relaxation
-177 Change

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<th>Competition</th>
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Thank you for attention