



FENOMENU OKURENSIA BEE-MANAS IHA ALDEIA BEDIK ZERO DOIS, SUKU FATUHADA, POSTU DOM ALEIXO, MUNISIPIU DILI

I. Introdusaun

Iha loron Tersa Feira 31 Maiu 2022 mosu fenomenu bee-manas iha Aldeia Bedik Zero Dois, Suku Fatuhada, Postu Dom Aleixo, Munisipiu Dili. Uniku fenomenu bee-manas nee mosu depois de rai nakdoko iha loron Sesta-Feira, 27-05-2022 [11:36 OTL] ho forsa 6.3 SR [Scale Ritcher] no profundidade 61 Km iha Tasi-Mane Suku Lore, Postu Administrativu Lospalos, Munisipiu Lautem.

Fenomenu okurensia bee-manas iha Aldeia Bedik konsidera nudar gas pantanhu neebe forma hosi prosesu biogeniku no termogeniku. Naturalmente, gas pantanhu biogeniku forma hosi restus organismu iha area pantanhu depois preserva no sai fase gas. Komponente primariu hosi gas pantanhu mak metanu (CH_4) neebe jeralmente hetan iha neebe deit iha rai-leton. Gas pantanhu hanesan gas hidrokarbonu neebe fasil atu lakan, iha korente karbonu badak (C_1) tan nee sai nudar gas neebe kaman liu kompara ho anin, nunee, sei suar makas wainhira espalha iha atmosferu. Iha area neebe ladun klean, liu-liu area pantanhu gas sei mosu tamba prosesu biologia hanesan bakteria dekomposisaun neebe hasai gas no ida nee mak bolu ho gas pantanhu (Wibowo, H.K., 2015). Tuir Schoell (1988) prosesu formasaun gas pantanhu fahe ba prosesu prinsipal tolu (3) mak hanesan:

1. Fermentasaun bakteria anaerobiku (moris iha area reduksaun) iha lisu, foer animal nsst. Gas neebe hetan hosi prosesu ida nee hanaran biogas metanu ou gas biomasa.
2. Fermentasaun bakteria asetikas iha kamada sedimentu neebe riku ho materia organika ($\text{CH}_3\text{COOH} \rightarrow \text{CH}_4 + \text{CO}_2$)
3. Prosesu reduksaun (menus oksigeniu) CO_2 hosi bakteria fatuk vulkaniku ou magmatiku natural ($\text{CO}_2 + 2\text{H}_2\text{O} \rightarrow \text{CH}_4$).

Liu tan, kondisaun geologia pasadu hanesan area pantanhu ho interkalasaun fatuk hosi grau finu no grosu nudar fatin neebe ideal ba ambiente formasaun gas pantanhu. Gas pantanhu neebe isoladu iha sedimentu neebe ladun klean sei sai naturalmente tamba prosesu geodinamiku hanesan rai halai nunee gas pantanhu neebe isoladu sei sai mai liur liu hosi kamada nakfera nudar bee-manas ou gas. Geologia regional folha Dili hatudu katak area Bedik nudar area pantanhu iha neebe dala-barak bee nalihun iha neeba banhira udan makaas no kontein ho aluviaun depositu hosi material rai-tahu atividade fluviaun nian (IPG-TL, 2014).

Bazeia ba teoria gas pantanhu neebe forma naturalmente no fenomenu bee-manas neebe akontese iha Aldeia Bedik, nunee, objetivu hosi peskija nee mak atu identifika tipu fenomenu bee-manas gas pantanhu no ninia impaktu ba komunidade.

II. Resultadu & Diskusaun

1. Parametru Fiziku Bee-manas Bedik

Bee-manas neebe mosu iha Aldeia Bedik ho nia karater fisiku bee neebe nakali mistura ho rai-tahu ho nia luan kuaze diametru 15 cm (Figura 1). Parametru fiziku bee-manas hatudu katak

area Bedik nudar area pantanhu ho zona osidasaun liuhosi teste ORP (*Oxidation Reduction Potential*) neebe hatudu valor positivu hanesan ho bee-posu neebe besik (kuaze distansia 10 m ho nivel bee-rai okos 40 cm). Ida nee hatudu katak fermentasaun bakteria anaerobiku no prosesu reduksaun CO₂ hosi bakteria laos sai kauza ba fenomenu bee-manas Bedik ida nee.



Figura 1. Bee-manas Bedik neebe nakali ho bee oituan kahur ho rai-tahu no suar (IPG-TL, 17 Junu 2022)

Atu haforsa liu tan, bee-manas Bedik laos mos parte ida hosi geotermiku tamba la hatudu evidensia fiziku geotermiku nian hanesan ezistensia *silica sinter*, *rotten egg odor* (iis manu-tolun dodok hosi sulfuriku) maske bee-manas nia nakali kuaze 100 °C. Bee-manas Bedik mos hatudu fenomenu uniku oituan iha neebe bee-manas nee bele soke ita ou hatudu korente eletrika bainhira ita kaer ekipamentu kondutor hanesan besi hodi hatama ba bee-manas laran. Posibilidade iha ligasaun ho parametru fiziku bee-manas nee rasik iha neebe hatudu valor elementu EC (*Eiectrical Conductivity*), TDS (*Total Dissolved Solid*) no Salinidade neebe aas, normalmente kontiudu masin nudar kondutor diak ba eletrisidade.

Tabela 1. Rezultadu parametru fiziku bee-manas iha Aldeia Bedik (IPG-TL, 2022)

Parameters	Analysis Method	Natural Range References	International Standards	References	Field Measurement
pH	Multi-Parameter PCTestr™ 35	6,5 - 8,5	6,5 - 8,5	WHO, 2007	7,70
EC (µS) -> 1 mS = 1000 µS	Multi-Parameter PCTestr™ 35	30 - 2000	200 - 800 µS	Sensorex, Inc., 2017	1273
TDS (mg/L = ppm)	Multi-Parameter PCTestr™ 35	30 - 6000	> 900	WHO, 2003	902
Oxidation Reduction Potential [ORP] (mg/L = ppm = %)	ORP METER				180
Salinity (mg/L = ppm = %)	Multi-Parameter PCTestr™ 35		< 1000	USGS, 2018	760
Temperature (°C)	Multi-Parameter PCTestr™ 35		10 - 30 °C	AG NHMRC, 2018	± 100 °C

Iha sorin seluk, analiza kimika ba amostra rai neebe besik iha bee-manas Bedik hatudu katak kontiudu masin amostra rai nian hosi elementu EC, Na, Mg, Cl, no Ca iha valor neebe aas, posibilidade nunee tamba area Bedik nudar ambiente kostal.

Tabela 2. Rezultadu parametru fiziku no kimiku amostra rai iha area bee-manas Bedik (IPG-TL, 2022)

Analyte Symbol	TOC	pH	EC	Na	Mg	Al	K	Ca	Mn	Fe	Hg	Ni	Cu	Zn	As	Ag
Unit Symbol	%			%	%	%	%	ppm	%	ppb	ppm	ppm	ppm	ppm	ppm	ppm
Soil Sampling	5	8.41	>2000	0.048	0.93	1.42	0.13	1.74	775	3.31	20	22.1	27.5	82.5	11.3	0.039

Liu tan, analiza kimika no mikrobiologika ba bee-posu DW 15 iha area bee-manas Bedik liu-liu hosi elementu nitratu, nitritu, amonia, sulfatu, total coliforme no E. Coli hatudu ezistensia

iha bee-rai okos neebe naturalmente mosu iha area pantanhu no mos dala-barak kauza hosi lixu doemstiku (valeta foer, sintina, nsst). Mapa distribuisaun bee-posu hosi Sidade Dili hatudu katak fluksu bee-rai okos sulin-tun ba area tasi (Figura 2).

Tabela 3. Rezultadu parametru kimiku no mikrobiologiku bee-posu (DW 15) iha area bee-manas Bedik (IPG-TL, 2022)

Elementu	NH3-N (mg/l)	NO3N (mg/l)	NO2-N (mg/l)	Fe (mg/l)	Mn (mg/l)	Fluoride (mg/l)	Sulfate (SO4)	T. hardness (mg/l)	T. Coliform (MPN/100 ml)	E.Coli (MPN/100 ml)
WHO Standard	1.5*	50*	3*	0.3*	0.4* ou 0.5*	1.5*	250*	200*	0*	0*
DW 15	0.01	1.2	2	0.02	9.8	2.69	64	0.42	1.100	93

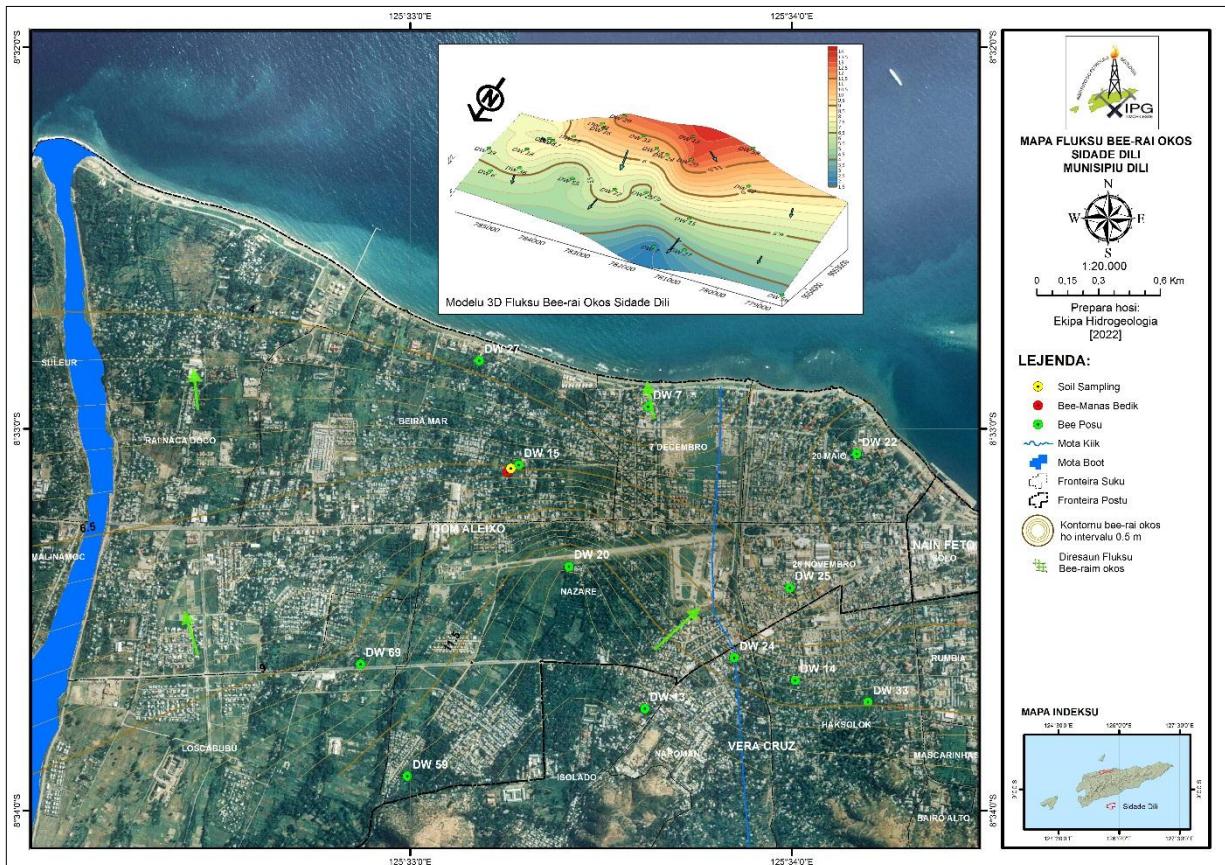


Figura 2. Mapa distribuisaun bee-posu no fluksu bee-rai okos Sidade Dili (IPG-TL, 2022)

2. Diskusaun

Bazeia ba kondisaun geologia, dadus kampu no analiza laboratoriu hosi Bee-manas Bedik, amostra rai, no bee-posu (DW 15) hatudu katak possibilidade hipoteza neebe persija dezenvolve mak “Fermentasaun bakteria asetikas iha kamada sedimentu neebe riku ho materia organika ($\text{CH}_3\text{COOH} \rightarrow \text{CH}_4 + \text{CO}_2$)” liga ba fenomenu okurensia bee-manas iha aldeia Bedik. Parametru fiziku amostra rai hanesan TOC no pH mos hatudu valor neebe signifikante iha neebe sedimentu rai-tahu nee riku ho material organiku neebe possibilidade mosu fermentasaun bakteria asetikas.



Figura 2. Ekipa foti amostra rai (klean 2 m) ho ekipamento Hand Auger iha area Bee-manas Bedik (IPG-TL, 2021)

III. Konklusaun & Rekomendasaun

Refere ba objetivu no rejultadu hosi estudu ida nee, konklusaun no rekomendasaun fahe deskreve tuir pontu hirak mai nee:

- Bee-manas Bedik konsidera nudar gas pantanhu ho profundidade badak neebe possibilidade forma hosi fermentasaun bakteria asetikas iha kamada sedimentu neebe riku ho material organika ($\text{CH}_3 \text{ COOH} \rightarrow \text{CH}_4 + \text{CO}_2$) no mosu mai iha rai-leten karik tamba kauza hosi geodinamiku hanesan rai-nakdoko iha Tasi-Mane Lore, Postu Lospalos loron hirak antes.
- Bee-manas Bedik laos rekursu geotermiku tamba la hatudu manifestasaun geotermiku maibe konklui nudar gas pantanhu haree hosi valor ORP bee-manas no bee-posu neebe positivu no mos TOC (*total organic content*) ho pH rai neebe aas.
- Rekomenda atu halo estudu klean liu-liu ba estudu geoeletrika hodi identifika klean hosi bee-manas Bedik no mos analiza laboatoriu ba kontiudu gas (metanu) liga ba bee-manas nia implikasaun ba komunidade no mos ninia genese.

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