



**Buku la alimi ansomba pansi pa porojeketi ya ICHLIEBE-FISCH motsogozedwa
ndi Associate Prof. Daud Kassam mothandizana ndi Associate Prof. Joshua Valeta
ndi thandizo lochokera ku boma la Germany.**

Olemba: Mofolo Sifo, Martha Alufeyo ndi Isaac Chaggwa

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MAWU OTSOGOLERA

Buku ili yalebedwa ndicholinga chothandiza alimi omwe ali pansi pa polojeketi ya ICHLIEBE-FISCH (I LOVE FISH). I LOVE FISH ndi polojeketi yomwe ikulimbikitsa njira zamakono za ulimi wa nsomba mophatikiza ndi ulimi wamasamba. Izi zikudza pamene kafukufuku waonetsa ku anthu ambiri m'Malawi muno makamaka ana ndi amayi oyembekezera ndi oyamwitsa amasowekera zakudya zopatsa thanzi ndipo nsomba ndi masamba zili ndikuthekera kwakukulu kochepetsa vutoli. Polojeketiye ikulimbikitsa kupanga zakudya zopatsa thanzi pogwiritsa ntchito nsomba masamba ndi zina zopezeka madera akumidzi kudzera m'magulu akumudzi. Polojeketiye ili ndi mbali ina yakafukufuku yomwe ikuyang'ana njira zopangira mbewu ya nsomba yamakono pamodzi ndi alimi zomwe zidzathandize kuti alimi adzathe kupitiriza zomwe kafukufukuyi azepe mosavuta pambuyo pa ntchitoyi. – **Daudi Kassam (Mkulu oyendetsa Polojeketi).**

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MASAMALIDWE ANSOMBA KUTI ZIKULE BWINO

(Martha Alufeyo, QUALivES Ltd, Lilongwe)
zinthu zoyenera kuziwa tisanayambe kuweta nsomba

- Kuphwetsa damu
- Kukhala ndi madzi oyenera mu damu
- Kuika nsomba za mbewu mudamu
- Kuthira layimu/Phulusa
- Kuthira manyowa/fetereza
- Kapangidwe ka chakudya cha nsomba
- kudyetsera nsomba moyenera
- Kuteteza nsoma za mu damu ku zilombo
- Kukolola nsomba moyenera

Ubwino wophwetsa damu

- Kupha madzira a tizilombo towononga nsomba
- Kuchosa nsomba zosalira
- Kuthandiza kuwolerana kwa manyowa

kuthira layimu/phulusa



Chithunzi choyamba: kuonetsa damu ikuthridwa layimu

- Layimu athiridwe patasala masabata awiri kuti tiyike nsomba mu damu
- Amachosa asidi wa munthaka yemwe amaononga nsomba
- Amathandiza kuti manyowa agwire bwino ntchito
- Amathandiza kupewa tizilombo towononga nsomba

Ubwino wothira manyowa mu damu

- amachulusa chonde cha nthaka ya mu damu
- Amachulusa zokolola
- Fetereza wa NPK amathanso kugwiridwa ntchito
- amathandizira kukulisa zomera za mu damu zomwe ndi zakudya za nsomba

- Manyowanso ndi chakudya cha nsomba

Kuziwa ngati madzi a mu damu mwathu akufunika manyowa

Njira yoyamba

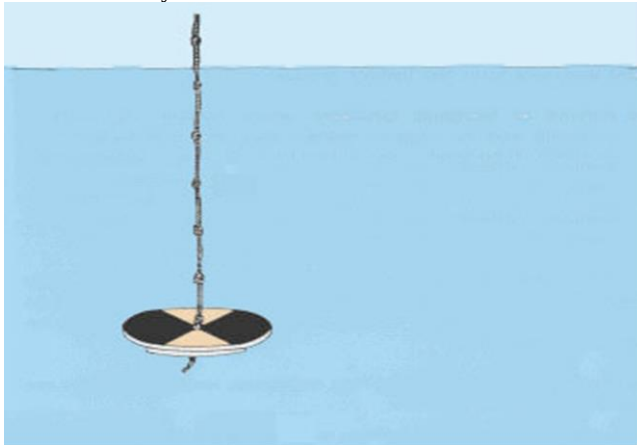
Ngati tikuona songa za zala zathu
titaviika mkono wathu mudamu
ndiye kuti madzi a mu damu
mwathu akufunika manyowa

Njira yachiwiri

- Seki disiki

Mapangidwe

- Lata
- Chingwe
- Penti woyera ndi wokuda



Chithunzi chachiwiri: kuonetsa kayezedwe kamadzi pofuna kudziwa ngati ali ofunika manyowa pogwiritsa ntchito seki disiki

Mulingo wamanyowa wothira mu damu

- 1000kg/ha/week
- 1ha = 10000
- $10 \times 20 = 200$
- $200 \times 1000\text{kg} = 200\,000$
- $200\,000 / 10\,000 = 20\text{kg}$

Mulingo wa fetereza othira mu damu

- 23:21:0+4S
- Urea
- Ammonia sulphate
- DAP
- CAN

Kukula kwa damu (m ²)	Mlingo wa pasabata (paketi ya Chibuku)
200	¼
400	½
800	¾
1,000	1¾

Madzi oyenera mu damu

- Madzi a mu damu sayenera kukhala oyera ngati okumwa
- Madzi sayeneranso kukhala okuda kwambiri
- Madzi mudamu sakuyenera kuchepera 1mita
- Madzi abwino amaoneka obiriwira (green)



Chithunzi chachitatu: kuonetsa Damu la madzi obiriwira

Kuika nsomba mu damu

- Nsomba 5/m²
- Nsomba zimayenera kuikidwa mu damu mmamawa kapena madzulo

CHAKUDYA NDI KADYETSEDWE KA NSOMBA.

(Isaacs J Chaggwa, LUANAR)

Chakudya ndi chofunika kwambiri pa cholengedwa chilichonse pakuti chimapatsa thanzi ndi kuteteza ku matenda.

MTUNDU WA CHA KUDYA CHA NSOMBA.

Mtundu ya cha kudya cha nsomba ndi ya mbiri ndipo ndiyoyikidwa mmgawo magawo ndi mmagulu ake:-

Chakudya chachilengedwe
Chakudyacha chowonjezera

Chakudya chosakaniza

CHAKUDYA CHA CHILENGEDWE (Natural food)

Chakudya chachilengedwe chimapezeka mu madzi momwemo ndipo chimapangidwa kudzera mu kuthira manyowa kapena fetereza mu damu

Zakudya zake ndi izi:-

- Ndere (phytoplankton)
- Tizirombo tating'ono kwambiri (zooplankton)
- Gulu la tizirombo tina ndi nyongolosi (crustaceans/ benthos)

Chakudya cha chilengedwe ndi chofunika kwambiri ku ana a nsomba chifukwa ana a nsomba amalandira malinga ndi kukula kwa pa kamwa pawo.

CHAKUDYA CHA KUWONJEZERA (supplementary feed)

Chakudya ichi chili magulu awiri:-

- Chomanga thupi kuchokera ku mtengo (plant protein)
- Chomanga thupi kuchokera ku nyama (animal protein)

Chakudya ichi ndi choyenera kuti chidzithandizira chakudya cha chilengedwe mu damu komanso ngati cha chakudya cha chilengedwe chikuchepamo kapena kusowa kumene.

MITUNDU YA CHAKUDYA CHOWONJEZERA.

MADEYA (Bran)-	mpunga, chimanga, mapila, tirigu, soya masese
NYAMA (animal)-	nyongolosi, nsomba, ngumbi ziwala
MASAMBA (leaves)-	chinangwa, abichi, bonongwe chisoso, mwamunaligone
ZIPATSO (fruits)-	mapeyala, mango, mapapaya, gwafa

Izi nsomba zimadya koma tisamadalire pa gulu limodzi lokha ai ndiye nsomba si zikula msanga ndi ku khala ndi thanzi.

Chakudya chowonjezera chili mmagawo awiri :-

- chamtundu umodzi (single diet Supply)
- chosakanidza (formulated diet supply)

CHAMTUNDU UMODZI (Single diet)

Ichi ndi chakudya choperkedwa ku nsomba cha mtundu umodzi wa madeya monga a chimanga, a mpunga kapena a soya paokha paokha,

CHOSAKANIDZA (formulated diet)

Ndi kusakanidza mitundu ingapo ya zakudya kuiphatikidza kuti ukhale umodzi monga kuphatikidza gulu la madeya ndi la nyama kapena la madeya lokha lokha kuti likhale chakudya chimodzi

Chitsanzo :-

Tikufuna kuphatikidza madeya ndi soya, titenge mbale imodzi ya ufa wa soya ku mbale zinayi za madeya ($1 : 4 = 5 = 18\% \text{ cp}$) Kapena kuphatikidza madeya ndi nsomba ndi kusakanidza limodzi, ndi kutenga mbale yimodzi ya ufa wa nsomba ku mbale imodzi nditheka ya madeya ($1 : 1.5 = 2.5 = 30\% \text{ cp}$). Chakudya ichi chipangidwe malinga ndi mtundu wa nsomba komanso kukula kwake.



Chithunzi chachinayi: Chitsanzo chakakonzedwe ka chakudya chansomba chama peletsi

MULINGO NDI KADYETSEDWE KA NSOMBA.

MULINGO WAKE

Mulingo wa chakudya umaperekedwa malinga ndi kuchuluka kwansomba mu damu ndi kukulanso kwa damu. (fish biomass /area)

Chisanzo:-

$$\begin{aligned} &100\text{kg/ha} \\ &(100/10000) * 5\% = 100000 \times 5 / 100000 \times 100 = 0.5\text{kg /m}^2 \end{aligned}$$

KADYETSEDWE KAKE

Kadyetsedwe ka nsomba kamafunika kuwonesetsa kukula kwa nsomba chifukwa nsomba za zing'ono zi mafunika kudzipatsa chakudya pafupi pafupi (6 – 4 times /day) pamene za zikulu zingalandire chakudyakatatu kapena kawiri patsiku (3 – 2).

Kaperekedwe kake.

Chakudya chingapatsidwe monga kuchita kuwaza (broadcasting feeding) kapena pamalo amodzi (spot feeding). Ngati ndichowaza tidziwenso kumene kukuchokera mphepo kuopa kuwononga chakudya ndi mphepo, ndipo ngati ndi pamalo amodzi payikidwe chodyeramo chake (Food tray/trough).

ZOFUNIKA ZINA

Ngati kwa zidzila siyani kudyetsa kapena kuchepetsa chakudya,

Ngati nsomba si zikusangalala tiyimitse kudyetsa kuti tiwonerepo kaye,

Ngati damu likuwonetsa thobvu tiyimitsechakudya kuti tiwone chimene cha

Chitika ndi chiyani.

Ngati nsomba zikuwonetsa milomo pa mwamba tisadyetse kaye.

CHAKUDYA CHO SAKANIDZA.

1. Mukhale chakudya cha magulu onse
2. Chilandiridwe ndipo chikondedwe ndi nsomba pa kuchidya
3. Kukula kwa chakudya (particles) kufanane ndi kukamwa kwa nsomba
4. Chikhale mmadzi mpakansomba yitachidya chonse
5. Chikhale cha ufa (powder), chamisele (Crumble), kapene cha cheula (pellets)
6. Chikhale cha ana (larve/fry) lachinyamata (Fingerling)kapena za zikulu (adult)
7. Chikhale cha nsomba zobereka (broodstock), cha nsomba za ana (fry/fingerling), cha nsomba za kuweta (rearing/production/growout).

CHAKUDYA CHOSAKANIDZA NDI CHABWINO KWAMBIRI PAKUTI MAGULU ONSE A ZAKUDYA AKUPEZEKA PANTHAWI YIMODZI, CHIMAMANGA THUPI NDI KUTHANDIZIRA NSOMBA KUTI ZIDZIBEREKA BWINO ANA ATHANZI.

ULIMI WAKASAKANIZA MODALIRANA NDI Ulimi wa nsomba (INTEGRATED AGRICULTURE – AQUACULTURE SYSTEM)

(Mofolo Sifo, QUALivES Ltd)

Kamba kazotsatira zakusintha kwa nyengo pa dziko lonse, boma ndi ma bungwe akhala akulimbikitsa alimi dziko muno kulima mbewu ndikuweta ziweto zosiyanasiyana.

Ulimi utha kukhala wakasakaniza koma osadalirana; choncho ndikofunika kunvetsetsa bwino m'mene ulimi wakasakaniza ungalumikizirane wina ndi unzake.

Kukhala ndi anthu athanzi m'dziko ndimaziko achitukuko cha dziko lililonse, ndipo kuno kwathu ku Malawi, Anthu pafupifupi 60 mwa anthu 100 aliwonse amapeza chakudya chomanga thupi (ANIMAL PROTEINS) kuchokera ku nsomba.

Kwa zaka zochuluka, Malawi yakhala ikudalira nsomba zochokera ku Nyanja ndi mitsinje koma kamba kakukwera kwa chiwerengero cha anthu, nsomba m'nyanja ndi m'mitsinje zikunka zichepa
Izi zikutanthauza kuti thanzi la miyoyo ya anthu ochuluka makamaka akumudzi ili pachiopsezo kamba kakuchepa kwa nsomba mnyanja zathu.
Ichi nchifukwa chake, ulimi wansomba ukulimbikitsidwa pofuna kuthandiza nyanja ndi mitsinje kukwaniritsa kachulukidwe ka nsomba zomwe zikufunika ndi anthu kuti adye mdziko muno.

Ulimi wakasakaniza

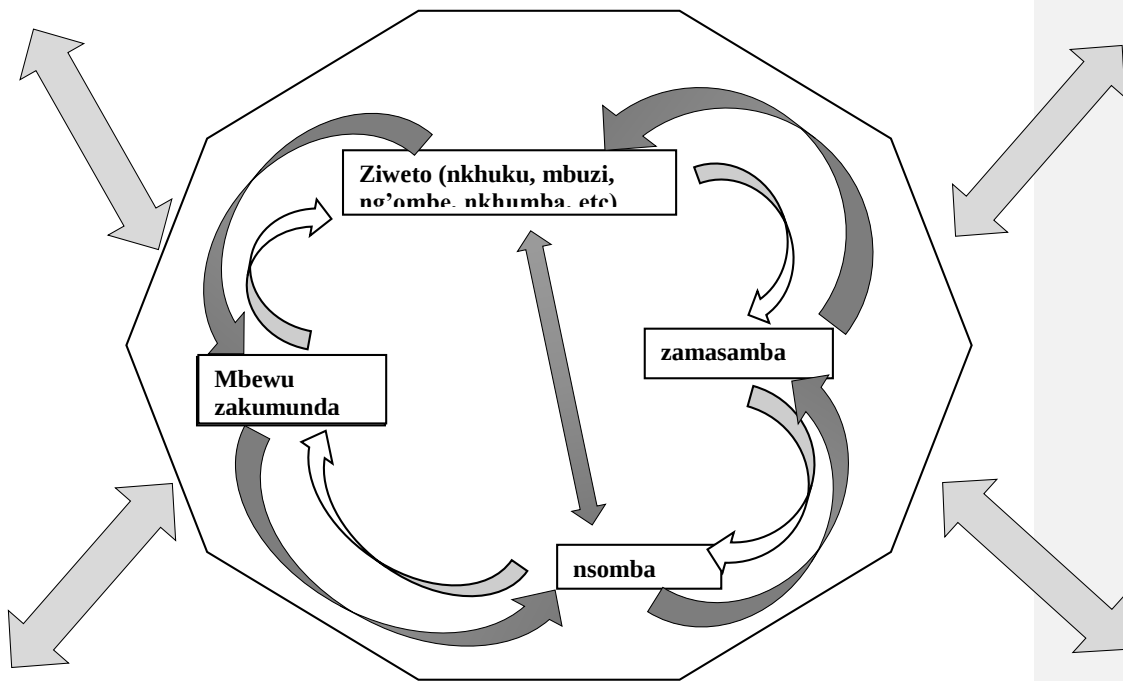
Uwu ndipamene mlimi alima mbewu ndikusunga ziweto zosiyanasiyana, maulimiwa akhoza kukhala oima paokha paokha ngati palibe kudalirana kulikonse.

Ulimi wakasakaniza modalirana ndi ulimi wa nsomba

Uwu ndi mlingo wina wopitirira kungolima mbewu / kusunga ziweto zosiyanasiya kapena nsomba pa damu, koma apa ndipamene zotsalira kapena zinyatsi za kwina zimathandizira ngati zolowa kulimi unzake pansi pa mlimi yemweyo.
Izi zimathandizira pakupereka mphanvu, manyowa kapenso chakudya



Chithunzi chachisanu: Chitsanzo cha ulimi wodalirana pakati pa nsomba ndi mbewu



Chithunzi chachisanu n'chimodzi: kuonetsera mene magawo osiyanasiyana aulimi wa (mbewu ndi ziweto) angalumikizirane ndi ulimi wansomba modalirana

UBWINO WA ULIMI WAKASAKANIZA MODALIRANA PAKATI MBEWU, NSOMBA NDI ZIWETO

umathandiza kuchepetsa kudalira katundu ogwiritsa ntchito yemwe amagulidwa ku ma golosale monga feteleza, makhwala a mbewu, chakudya cha ziweto/nsomba, mphanvu ndi zina zambiri

umachulukitsa phindu pa malo ndi ntchito yogwiridwayo.

Umathandiza pakupereka mwayi waukulu opanga katundu wapamwamba pogwiritsa ntchito zokolola kuchokera mu ulimiwu.

umathandiza kubwezeretsa chonde m'munda

umathandiza kuthana ndi ndi matenda ndi tizilombo togwira mbewu

umathandizira kagwiritsidwe ntchito ka zinyalala ndi zinyasi za ziweto (ndowe kapena zitosi)

umapititsa patsogolo kagwiritsidwe ntchito kamalo

umachulukitsa zokolola pa malo

umathandiza kupereka zokolola zosiyanasiyana

Komanso kuonetsetsa kuti chilengedwe chikusamalidwa ndikusungidwa bwino pochepetsa matenda ndi tizilombo tambewu munjira zachilengedwe kulekana ndikugwiritsa ntchito mankhwala ndi feteleza.

ZOLINGA ZA ULIMI WAKASAKANIZA MODALIRANA NDI ULIMI WA NSOMBA

Zolinga za ulimi wakasakaniza ndi ulimi wa nsomba ndi;

- Kupereka njira zopezera ndalama zomwe zili zokhazikika kwa alimi pochulukitsa zokolola
- Kuyesetsa kupanga ulimi omwe uli osaononga chilengedwe mwa njira ina kapena inzake.

KULUMIKIZANA KWA MAULIMI MU ULIMI WAKASANIZA WODALIRANA NDI NSOMBA

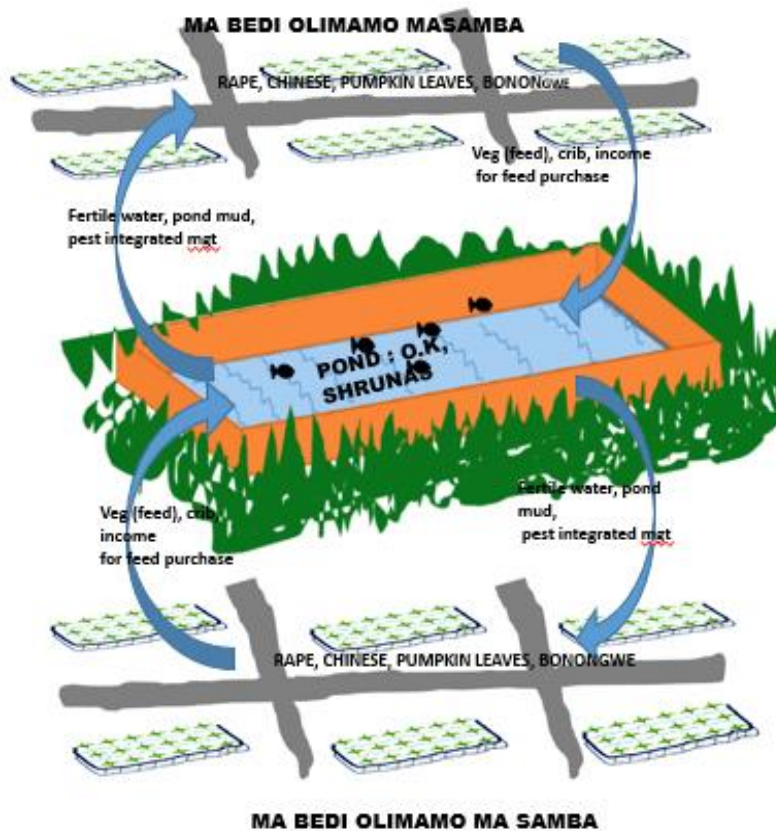
- Mbewu-ziweto
 - Manyowa kupita kumbewu
 - Chakudya cha ziweto kuchokera ku mbewu
- Mbewu-nsomba
 - Chakudya cha nsomba kuchokera ku mbewu
 - Madzi achonde kuchokera mu damu la nsomba opangira mthirira
 - Ndalama kuchokera kuzogulitsa za nsomba zogulira feteleza ndi mankhwala opha tizilombo.
 - Kukwera kwa chinyontho pamalo pomwe pali damu la nsomba
- Ziweto-nsomba
 - Manyowa kuchokera ku ziweto othira mu damu la nsomba
 - Zakudya za nsomba kunsomba zomwe zimadya nyama (carnivores) kuchokera ku zotsarira ku ziweto zophedwa
 - Chakudya chaziweto kuchokera ku nsomba zoonongeka (fish trash)
 - Madzi omwetsera ziweto kuchokera pa damu la nsomba
- Mbewu-ziweto-nsomba
 - Umalumikizitsa ma ulimi onse omwe afotokozedwa ku mwambaku ndipo maubwino ake amagona pa fundo zomwe zafotokozeredwa kale ku mwambaku.

Ndondomeko pakasankhidwe ka mbewu kapena ziweto kuti zilumikizitsane ndi ulimi wansomba

- ziweto
 - Ziweto mu ulimi wakasakaniza, zimasankhidwa potengera zomwe banjalo limadya, kupezeka kwa misika yabwino komanso kupezeka kwa zinthu zonikira posunga ziwetozo.

- Nthawi zambiri ziweto zomwe zimawetedwa mu ulimi wakananiza ndi nsomba ndi monga; Nkhumba, ng'ombe, nkuku/bakha, akalulu ndi nyama zina zing'onozing'ono
- **mbewu**
 - Kasankhidwe ka mbewu zoti zilumikizitsidwe ku ulimi wakananiza ndi nsomba zimatengera zomwe banjalo imadya, kupezeka kwa misika yabwino, mtundu wa nthaka/dothi, kagwede ka mvula, komanso mtundu wa ziweto akuweta.
 - Zina mwa mbewu mu uli wakananiza ndi monga; zamasamba, chimanga, soya, nyemba, nthochi, mzimbe, mpunga, udzu waziweto
 -

Ulimi wamasamba modalirana ndi ulimi wa nsomba (fish – vegetable integrated system)



KUTSENDERA ZONSE (CONCLUSION)

Ulimi wansomba ndiwaphindu ngat alimi atsata njira zamakono za ulimiwu monga kukonzekeretsa ma damu pamene afuna kuikamo nsomba, kupeza mbewu yansomba m'malo oyenera, kudyetsera nsomba moyenera ndichakudya choyenera chamakono, kutsata ulimi wansomba wodalirana ndi maulimi ena monga mbewu ndi ziweto ndikupeza misika yoyenera ndiyopindulitsa.