Chololo planting pits

Small pit cultivation for maize, sorghum and millet (Chololo pits)

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mashimo ya chololo (Kiswahili)

Small planting pits are used for the cultivation of maize, sorghum and millet in order to improve water harvesting

Pits of about 0.20 - 0.25 m deep and 0.20 - 0.25 m diameter are excavated in lines across the slope. The spacing is approximately 0.5 m from pit centre to pit centre within lines and 1.0 m between lines. During excavation soil is normally heaped below each pit. The spaces between pits are not cultivated. Pits are made during the land preparation period, before the rains. Planting millet seed in the pits follows. Part of the excavated soil is returned to cover the seed, but a depression remains to permit water harvesting. Sungula has a stick – that he shows to visitors - with which he measures depth. Construction of contour bunds to control runoff from outside the plot is carried out in places. There is no strict design, as the farmer is still testing various types. The contour bunds protect the pits (which partially fill with sediment during the season) from excess runoff, and minimise soil erosion.

Purpose of the Technology: The primary purpose is to improve crop production. In terms of soil and water conservation, the moisture status in the soil is raised through water harvesting. Simultaneously, sheet erosion is controlled.

Establishment / maintenance activities and inputs: Pits are generally desilted on an annual basis, but new ones are only constructed, in spaces between the original pits, after a few years. Maintenance is also required for the bunds between the pits.

Natural / human environment: Kenneth Sungula and his family are dependent on his 4 hectares of gently sloping land in Chololo2 village. The family own no livestock, other than a few chickens. They grow millet and cowpeas as their main annual crops. Neither Sungula nor his wife are literate. His novel technology dates back to 1978,
when Sungula stumbled upon the idea by accident. He noted that some plants growing in a small depression in the ground were strongly outperforming others nearby. He then began to experiment by deliberately creating small planting pits. Sungula claims that 'his stomach taught him' how to make the pits. His meaning is clear: hunger drove him to find a more productive system of production. These chololo pits, named after the local village, hold runoff, and the spaces between the pits act as micro-catchments. The extra moisture is vital in initial establishment of crops in this semi-arid area, where the first rains can be erratic.

: Dodoma urban, Dodoma,

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- 36.1946, -6.4114

: (approx. 10-100 2)

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(> 50)

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- : - , - , - , cowpeas : 1

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- Ha:

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Chololo planting pits

Location: Dodoma. Tanzania

Technical knowledge required for field staff / advisors: moderate

Technical knowledge required for land users: low

Main technical functions: control of concentrated runoff: retain / trap, water harvesting / increase water supply

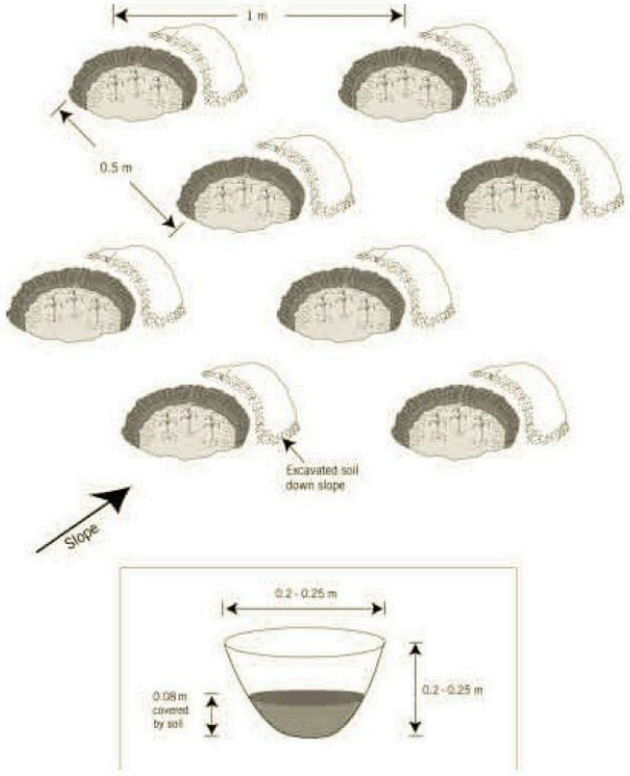
Secondary technical functions: control of concentrated runoff: impede / retard, reduction of slope length

Retention/infiltration ditch/pit, sediment/sand trap
Vertical interval between structures (m): 0.9
Spacing between structures (m): 0.3
Depth of ditches/pits/dams (m): 0.9
Width of ditches/pits/dams (m): 0.9

Structural measure: bunds/banks: contour
Vertical interval between structures (m): 0.9
Height of bunds/banks/others (m): 0.4
Width of bunds/banks/others (m): 0.9

Construction material (earth): escavated top soil

Lateral gradient along the structure: 15.00%



- (**ha**)
- ( ) 1 USD =
- 1.90

labour affect the cost, soil type also affects the durability of the tools

1. land clearing, digging pits (/ : Aug-Oct)
2. sowing and 3" covering (/ : Oct)

3. weeding (/ : dry season)
4. construction of big bunds (/ : oct-nov)

			( )	( )	%
Labour	persons/day/ha	336,0	1,9	638,4	100,0
Tools	ha	1,0	6,25	6,25	100,0
Compost / manure	ha	1,0	124,0	124,0	100,0
				768.65	
				768.65	

1. Repair small bunds (/ : after/3-6 times)
2. construction of protecting bunds (/ : Oct- Nov/annually)

			( )	( )	%
Repair small bunds an construction	persons/day/ha	104,0	1,9	197,6	100,0
Tools	ha	1,0	6,25	6,25	100,0
Compost / manure	ha	1,0	124,0	124,0	100,0
				327.85	
				327.85	

400.0

- [ ] < 250
- [ ] 251-500
- [x] 501-750
- [ ] 751-1,000
- [ ] 1,001-1,500
- [ ] 1,501-2,000
- [ ] 2,001-3,000
- [ ] 3,001-4,000
- [ ] > 4,000

- [ ] (0-2%)
- [ ] (3-5%)
- [x] (6-10%)
- [x] (11-15%)
- [ ] (16-30%)
- [ ] (31-60%)
- [ ] (>60%)

- [ ] 0-100
- [x] 101-500
- [ ] 501-1,000
- [ ] 1,001-1,500
- [ ] 1,501-2,000
- [ ] 2,001-2,500
- [ ] 2,501-3,000
- [ ] 3,001-4,000
- [ ] > 4,000

- [x] (0-20)
- [x] (21-50)
- [ ] (51-80)
- [ ] (81-120)
- [ ] (> 120)

- [x] / ( )
- [x] (,)
- [ ] / ( )

- [ ] / ( )
- [ ] (,)
- [ ] / ( )

- [ ] (>3%)
- [ ] (1-3%)
- [x] (<1%)

- [ ] < 5
- [ ] 5-50
- [ ] > 50

- [ ] /

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10%

10-50%

50%

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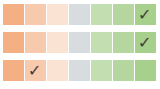
( )

( )

< 0.5
0.5-1
1-2
2-5
5-15
15-50
50-100
100-500
500-1,000
1,000-10,000
> 10,000



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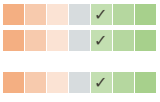

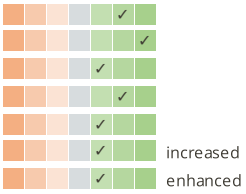

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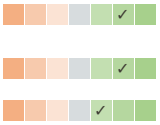

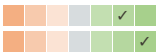

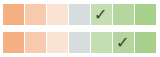

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- 1-10%
- 11-50%
- [x] > 50%

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- 0-10%
- 11-50%
- 51-90%
- [x] 91-100%

/

400 households covering 85 percent of the area stated (60 percent of all land users)

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- same as above

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- ability to harvest rain

  How can they be sustained / enhanced? construct big contour bunds
- ability to store water

  How can they be sustained / enhanced? ensure no water escapes
- ability to enable safe application of fym and compost

  How can they be sustained / enhanced? use mapambano compost developed by mama Suzana

/ / :

- same as above

/ / :

- tough job use of shovels
- dry spells have negative impacts increases size of pits after research

Editors

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: 28 2011 : 6 2019

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https://qcat.wocat.net/km/wocat/technologies/view/technologies_1395/

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- Inades Formation Tanzania (Inades Formation Tanzania)
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- Kithinji M., Critchley W. 2001. Farmers' initiatives in land husbandry: Promising technologies for the drier areas of East Africa. RELMA Technical Report series no. 27: