

# TECHNICAL FACTSHEET

## ZAINER

The Zainer is a groundbreaking agricultural implement designed to mechanize the conventional method of classic zai cultivation. It facilitates the formation of basins through the rotation of an auger located beneath the handles. Zai is a time-honored agricultural practice aimed at reclaiming and enhancing degraded land. It originated in the Sahelian regions of Burkina Faso, Niger, and Mali. This technique effectively captures water, organic matter, and nutrients, thereby enhancing infiltration, soil fertility, and agricultural productivity in arid environments. However, despite its advantages, the manually executed technology faces challenges in achieving widespread acceptance.

Use of the Zainer provides the following benefits:

- Decreased difficulty and time savings: over 300 hours/ha.
- Twice the yield in comparison to direct seeding.
- More cultivated area than manual zai.
- More resilient in drought-affected areas.
- Durable and easy to maintain, ideal for local manufacturing, and with straightforward repairs.
- Different economic models: Appropriate for shared services through cooperatives for rental or collective purchasing.

### TECHNICAL SPECIFICATIONS FOR THE ZAINER

- **Engine:** Compact gas-powered engine with a small cylinder, fuel consumption of about 1 l/h, equipped with a 4 l tank.
- **Diameter of the drilled holes:** 20 cm, with a depth between 17 and 20 cm.
- **Digging capacity:** 400-500 holes per hour, depending on soil conditions.
- **Productivity:** 1 hectare with over 30,000 planting holes, completed in 60-70 hours, equivalent to 5 work days.
- **Fuel consumption:** Around 60 to 70 l/ha, varying based on soil type.

### ZAINER SCALING

As a component of the Soil Values Program, the Zainer enhances zai technology by facilitating its broad implementation through:

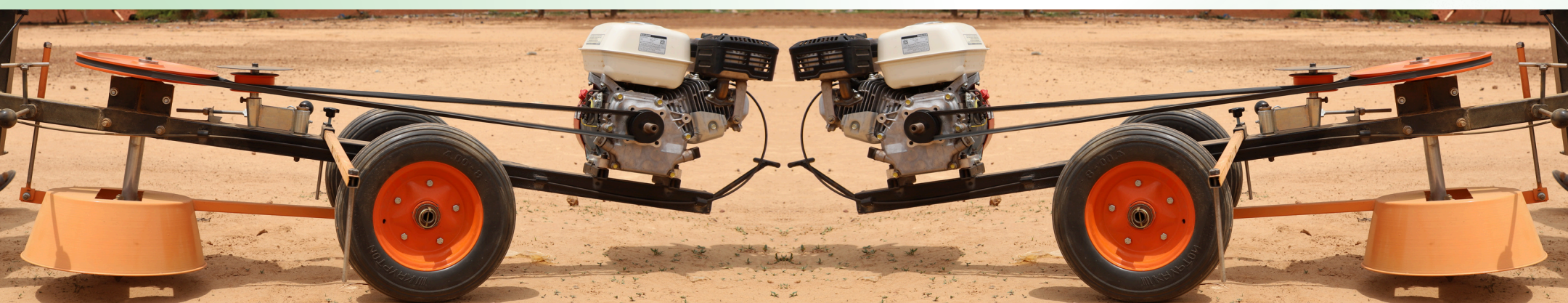
- Training and capacity development of Agricultural Equipment Use Cooperatives for service provision in partnership with the NGO Practica.
- Experimentation and demonstration on the site, incorporating the agroecological principles of the program (utilization of Bokashi compost, microdosing of fertilizers).
- Leveraging and disseminating knowledge from pilot sites via organized tours.

This business model presents a valuable opportunity for young individuals, particularly women, for generating income.

**Table: Comparison of Zai Practices**

|                          | Manual Zai | Mechanized Zai | Mechanized Zai with the Zainer |
|--------------------------|------------|----------------|--------------------------------|
| Working time (hours/ha)  | 330        | 35             | 61                             |
| Depth (cm)               | 12         | 8.51           | 11.84                          |
| Width (cm)               | 27.06      | 21.67          | 22                             |
| Yield (kg/ha)            | 1,413      | 625            | 1,844                          |
| Investment (FCFA/ha)     | 4,000      | 3,850          | 42,000                         |
| Variable costs (FCFA/ha) | 125,750    | 75,750         | 97,100                         |
| Net margin (FCFA/ha)     | 176,871    | 56,025         | 263,548                        |

Zongo et al. (2023)





## SUGGESTIONS FOR SUCCESSFUL EXECUTION

- ✓ **Training and awareness-raising:** Conduct practical demonstrations within the community to enhance local capacity and encourage widespread adoption, while increasing awareness of the agroecological advantages of zaï in the restoration of degraded soils and water management.
- ✓ **Access to resources:** Enhance inclusive financing mechanisms (loans, subsidies, equipment rental services) for smallholder farmers.
- ✓ **Climate adaptation:** Promote the use of zaï in combination with organic amendments (compost, Bokashi, biochar, etc.) to enhance soil resilience to drought. Incorporate zaï, through the Zainer, within a comprehensive landscape management strategy to optimize its effects on fertility, water recharge, and biodiversity.
- ✓ **Policy incentives:** Promote the integration of zaï into national land restoration and climate-resilient agriculture strategies, and establish local incentives (rewards, subsidies, community acknowledgment) for producers who adopt and sustainably implement the zaï practice.
- ✓ **Technical support:** Ensure consistent oversight by agricultural technical services to evaluate performance and offer assistance; create and distribute illustrated technical manuals on best practices of zaï and their integration with other technologies, such as agroforestry and assisted natural regeneration; establish a participatory monitoring system to record impacts on productivity, water retention, and soil restoration.



## REFERENCES

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- Beteo Zongo, Albert Barro, Sandrine Moyenga, and Saidou Simporé, 2023. Techno-economic performance of mechanizing sustainable agricultural water management: The case of the zaï practice in the Central Region of Burkina Faso. International Journal of Innovation and Applied Studies, Vol. 41, pp. 660-669



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