Assessment of agroecological knowledge and training needs of smallholder farmers in Burkina Faso

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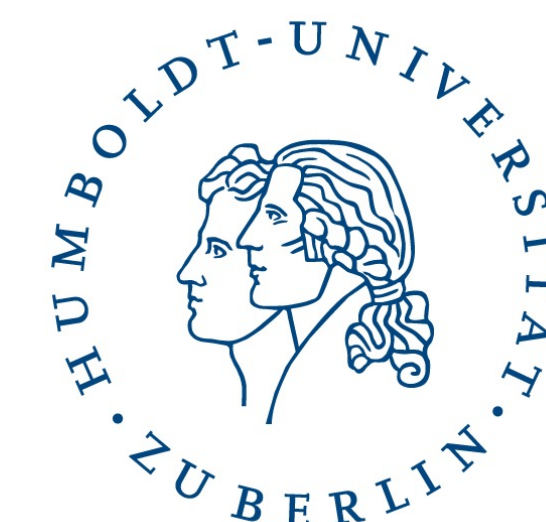
Background

Agricultural sector in Burkina Faso

- Agriculture contributes 20.4% to GDP [1]
- Sorghum and millet are the top two staple food crops[1]
- Soils in Burkina Faso are mostly Alfisols with a near neutral pH and low organic matter content[2]
- Burkina Faso remains very vulnerable to climate variations, resulting in loss of crops, decreases in agricultural yields and water resources, and land degradation[3]
- 11 million people, roughly 50% of the population, are moderately to severely food insecure (3-year average 2019-2021)[1]
- The situation is worst during the lean season - the period preceding harvest from June to August

Map: Zitenga County

Source: MaPhill -Map graphics revolution.™4

Zitenga county is located 70km north-east of the capital Ouagadougou. It is situated in the Plateau Central Province - one of the 14 provinces in Burkina Faso. The nutritive garden selected for the NUTRiGREEN Climate Field School is based in Boala, a village north of Zitenga. Based in a tropical-warm agroecologcal zone, the climate is semi-arid.

Nutritive Gardens

Nutritive gardens are areas set aside for the cultivation of non-timber forest products to improve household food diversification and nutrition. In each nutritive garden, moringa and baobab plants are planted, that provide edible leaves after only a few months. Moringa is rich in iron and contains vitamins A, B, C, D and E. Baobab leaves contain iron, phosphorus, potassium, magnesium and zinc.[5]

Source: Abel Yerbanga

Methods and Objectives

Climate Field Schools & needs review

A key activity of the project is the so-called *Climate Field School.* Here knowledge is shared on agroecology, growth and productivity of baobab, cassia and moringa trees, through trainings and regular observations in the nutritive gardens. Following a Co-Research* and Living Lab** approach the *Climate Field School* merges the pre-existing indigenous knowledge with science-based information.
The aim is to explore how nutritive gardens can make a contribution to bridging the lean session.
Pre-season interviews on agroecological practices were conducted to assess the existing local knowledge and training needs of the research farmers in Boala.

*This participatory research at co-equal level, draws on the perspectives, skills and knowledge bases of academics, practitioners and other stakeholders.
** Collaborative experimentation and development of new practical solutions between farmers, scientists and other stakeholders to accelerate innovation and adoption of more sustainable practices.

Survey objectives

- Identify current local knowledge levels in particular with focus on moringa, baobab and cassia
- Determine the training needs of women farmers in nutritive gardens

Method: Quantitative interviews with open questions

31 female small-scale farmers were interviewed between the 25. and 27. of April 2022 by the Agricultural Technician, Mr. Olivier Sawadogo. Information were collected and analysed using KoboToolBox[6].

Nearly two-thirds (65%) of the respondents had no formal education, hence were illiterate. This requires the use of different training tools and adapted methods.

Dissemination Method: Video and photography training

Source: Abel Yerbanga

To document the process and results for themselves as well as others, the farmers received smartphones and professional training on how to take quality pictures and videos.
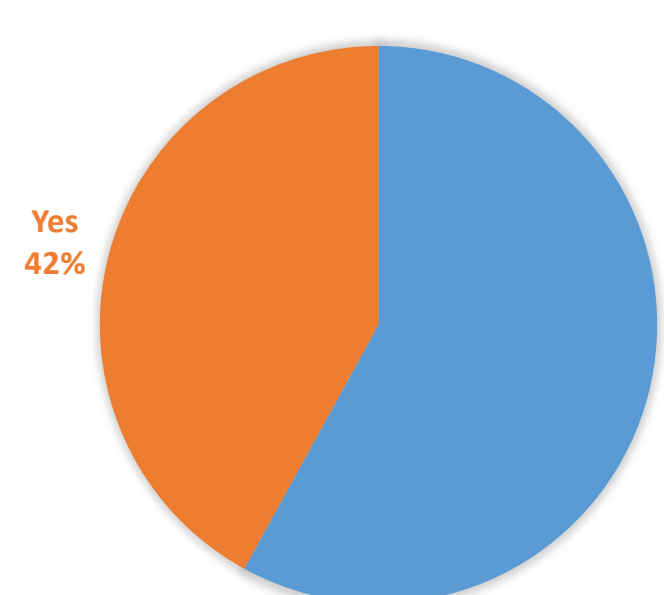
Encourage peer to peer learning and sharing their wisdom by linking students and agriculture officers and trainers they merge traditional wisdom with modern knowledge.

Source: Abel Yerbanga

Results

1. Do you know any plants that improve soil fertility?

Yes 42% No 58%

Plants names mentioned:
9 x Karité (Vitellaria paradoxa)
2 x Baobab (Adansonia digitata)
2 x White acacia (ferderbia albida)
1 x Neem (Azadirachta indica)
1 x Balanites (Balanites aegyptiaca)
1 x Thorny plants

2. Do you know any methods to predict the weather?

Of the 90% of respondents that answered 'yes', named following signs:
14 x Presence of clouds
10 x Changes in the wind direction
5 x The call of the cicada-insect
4 x The formation of new plant leaves
4 x fruiting of trees
3 x leaf fall of trees
2 x trees start to flower
1 x animals cry

3. Which farming practices retain water?

84% Cordons pierreux: thin lines of fist-sized stones laid across fields
65% Zai: a hole around a tree or plant dug in the soil to catch water

Other methods names were earthen bund, stone barriers, living (green) hedges, ridging, mulching, shea trees

4. Self-identified training needs by women farmers in Boala

Leaf conservation 4%
Composting 9%
Knowing good agricultural practices 35%
Plant care 52%
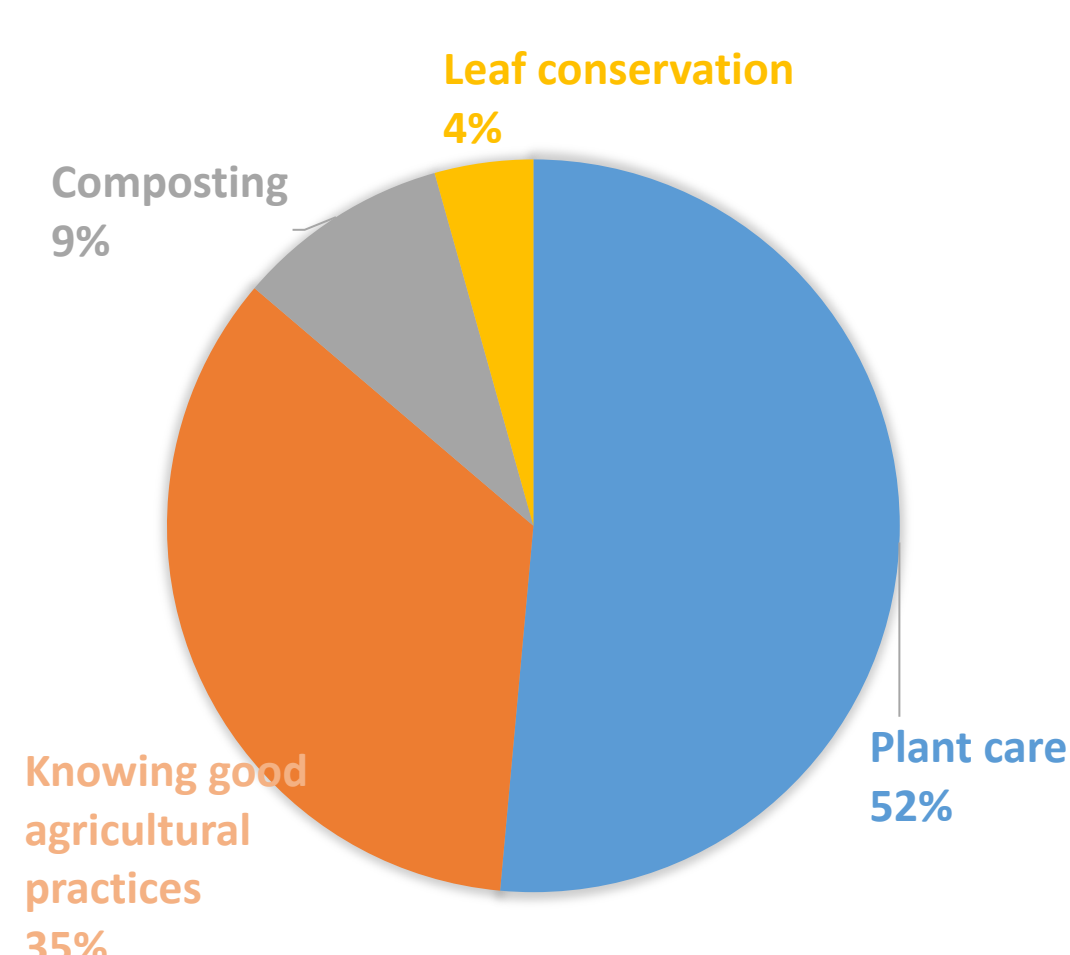
Other training needs mentioned by individual respondents were: Use of organic fertilizer, stock conservation and marketing, post-harvest stock management, more knowledge of plant pests, water and soil conservation techniques & knowledge of organic pesticides.

Results

The survey results indicated that the farmers in Boala:
- have some understanding of soil fertility & weather prediction
- implement adaptation strategies, such as applying water retention methods and measuring plant growth parameter
- have no challenges regarding diseases, parasites or predators for moringa, baobab and cassia

Next steps

- Execution of four agroecological trainings > based on the identified training needs
- Impact assessment of *Climate Field School* and review of the agroecological trainings, via n-gain evaluation method, used in education science
- Publication of the learning videos and pictures created by the farmers
- Evaluation of nutritive gardens as an effective bridging strategy during the lean season

Sources:
1. FAO. 2022. FAO statistical database. Burkina Faso https://www.fao.org/faostat/en/#data
2. Ty Beal, Cory Belden, Robert Hijmans, Alex Mandel, Michael Norton, and Jason Riggio, 2015. Country profiles: Burkina Faso. Sustainable Intensification Innovation Lab. Accessed 24 August 2022. https://gfc.ucdavis.edu/profiles/rst/bfa.html.
3. AFDB. 2022. Burkina Faso Economic Outook: https://www.afdb.org/en/countries/west-africa/burkina-faso/burkina-faso-economic-outlook.
4. MaPhill -Map graphics revolution.™,Map Zitenga. Accessed 12.08.2022. http://www.maphill.com/burkina-faso/oubritenga/zitenga/maps/physical-map/
5. Ministry of Agriculture, Burkina Faso. 2022. Accessed 12.08.2022. https://p2rs-brf.org/2022/01/04/implantation-de-jardins-nutritifs-au-profit-des-cooperatives-feminines-des-femmes-reconnaissent-et-chantent-les-valeurs-nutritives-des-feuilles-de-moringa-et-de-baobab-a-gomedyr-un-village-au-centr/
6. Paganini N. & Stöber, S. (2021) From the researched to co-researchers: including excluded participants in community-led research on urban agriculture in Cape Town, The Journal of Agricultural Education and Extension, 27:4, 443-462, DOI: 10.1080/1389224X.2021.1873157
7. KoboToolBox. 2022. https://www.kobotoolbox.org