



Towards sustainable and diversified organic coffee-and cacao-banana systems in eastern Democratic Republic of Congo

G. Blomme¹, W. Ocimati², L. Vutseme³, N. Safari Kitumaini⁴, M. Kamira⁴, and J. Ntamwira^{4,5}

¹The Alliance of Bioversity and CIAT, P.O. Box 5689, Addis Ababa, Ethiopia, G.Blomme@cgiar.org; ²The Alliance of Bioversity and CIAT, P.O. Box 24384, Kampala, Uganda, WOcimati@cgiar.org; ³Catholic University of Graben, Butembo, North Kivu, Democratic Republic of Congo, lusenge3@gmail.com; ⁴The Alliance of Bioversity and CIAT, P.O. Box 327, Bukavu, South Kivu Province, Democratic Republic of Congo, nancysafari21@gmail.com, mkamira2@yahoo.fr, ingiules2007@yahoo.fr; ⁵Institut National pour l'Etude et la Recherche Agronomiques, P.O. Box 2037, Kinshasa1, Mulungu Research Station, South Kivu, Democratic Republic of Congo; ingiules2007@yahoo.fr

Contact: G.Blomme@cgiar.org

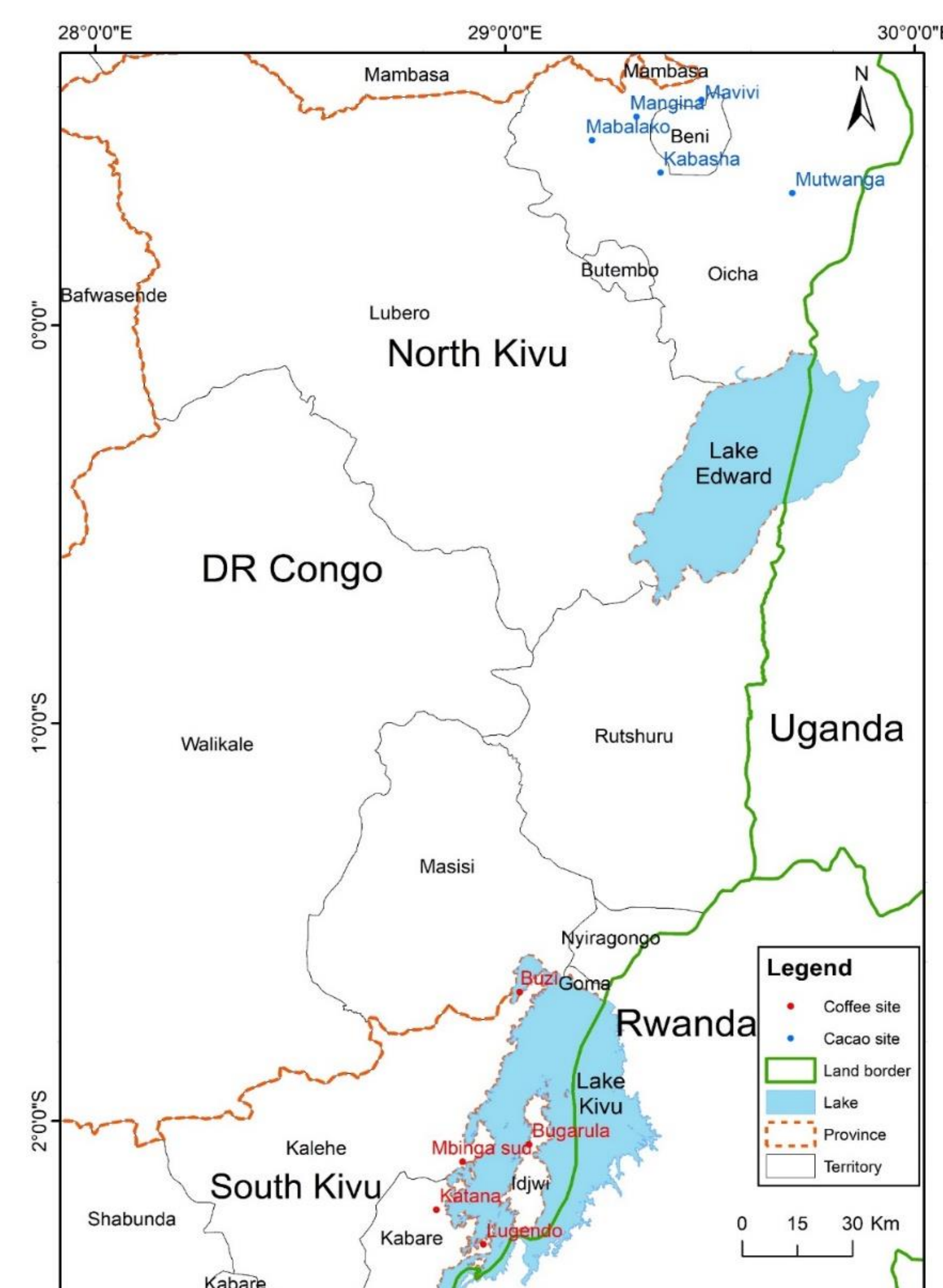


Coffee/cacao-banana systems in east DR Congo

- Significant production expansion over last decade.
- Coffee and cacao are often intercropped with banana, larger agroforestry trees, and annual crops depending on shade levels.
- Bananas provide shade for the coffee plants, and young cacao trees.
- Coffee (250 kg/ha) and banana (6 to 42 t/ha) yields are lower than expected yields of, respectively, up to 2000 kg/ha and 60-70 t/ha.
- Biotic constraints, and unsustainable cropping practices that over time increase competition between component crops and mine soils.
- Climate change effects increase yield gaps.

Focus group discussions [FGD] and farmer interviews

- **FGD** comprising men and women were carried out at 5 locations in North Kivu and South Kivu, giving a total of 20 FGD in each province. Each FGD comprised of 10 coffee-banana or cacao-banana producers, aged 20 and above.
- **Household surveys using structured questionnaires** were carried out with at least 15 farmers per site, totaling 77 and 75 farmer interviews in, respectively, South and North Kivu. Interviewed coffee and cacao farmers were affiliated to large coffee/cacao export companies and private plantations.
- **Good agronomic practices and novel sustainable intensification** approaches were documented.



Location of each coffee-banana and cacao-banana system Focus Group Discussions in, respectively, South Kivu and North Kivu province, DR Congo.



Focus group discussions



Coffee-banana intercropping



Mucuna under moderate shade

A wide set of good agronomic practices is applied by a substantial number of small- and large-scale organic coffee-banana and cacao-banana-farmers

- **Innovations** to improve soil health, increase system yield and strengthen the sustainability of smallholder/out-grower systems have over the past decade gradually been **introduced by a diverse range of stakeholders** including large exporting companies, private plantations, the public sector, and international and national research and learning institutions.
- **Optimal banana mat structure and spacing** for shade level management, **organic fertilization approaches** (e.g., banana leaf mulch, compost based on coffee pulp) and coffee **plantation rejuvenation** approaches using stumping and clean planting materials.
- Selection, multiplication and promotion of **high yielding coffee and banana varieties**.
- Some innovative practices introduced by small-scale farmers included: growing **passion fruit** on large shade trees in coffee fields, cultivation of **taro** under coffee-banana shade for edible leaves, establishment of **Vetiver grass** (*Chrysopogon zizanioides*) as hedges for erosion control and source of mulch and growing of **pineapple** plants as hedges around cacao fields.

Into the future: novel sustainable intensification approaches with potential.

- Hedgerows of **fast-growing shrubs** (e.g. Calliandra), **grasses**, fast growing shade- and drought-tolerant **leguminous N-fixing cover crops**, better suited **multi-purpose shade trees**, and the integration of **small livestock** should be further researched and/ or scaled to improve soil health and overall system performance, resilience and sustainability.
- Recent research has indicated that e.g., **mucuna**, when established during the **last month of the rainy season**, can grow and produce large amounts of biomass during the subsequent dry season months when no annual crops are in the fields, and under moderate shade levels. Mucuna can also be integrated during the **wet season months**, under limited to moderate shade levels, e.g. at the edge of fields, or in young plantings, depending on production priorities of farmers.

