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Data Article

Dataset for describing the diversity of household farming systems and the degree of crop-livestock diversification and integration in the Western part of Nile valley (Egypt)

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ABSTRACT

The CLIMED household farm dataset comes from a data collection conducted from 2013 to 2014 in five zones of the New Reclaimed Lands in the western part of the Nile Delta (Egypt). The main objective was to describe the diversity of household farms' assets and activities, the degree of crop and livestock integration at the farm level to assess the link between integration, diversification, efficiency, and livelihoods. This data set permitted to compare the diversity of farming systems of 175 household farms and to assess the economic and technical performances of crop-livestock systems along a geographical transect of reclaimed desert lands in Egypt. This dataset was the primary material in the research paper on "Multi-criteria assessment of the sustainability of farming systems in the reclaimed desert lands of Egypt" (See the related research article.). Data described the three main components of the family farm system, i.e., the land, livestock, and household systems, respectively. The description of each activity (mainly crop, animal, or off-farm) by detailing all the incoming and outgoing flows of inputs and outputs allowed

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investigating the economic and financial contribution of each activity and the degree of dependence or complementarity between them. The dataset provided two tables of analyzed data related to, respectively, 'diversification and integration' and 'efficiency and wellbeing.' Moreover, this dataset constitutes an original material regarding the living conditions and farm functioning in the new lands reclaimed over the last 50 years in Egypt. The survey data were entered into an Access database, checked with statistical cross-checking variables, and completed by field return for missed or non-coherent data.

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Specifications Table

Subject area	Household farm system; household's activities; Crop-livestock integration; efficiency; diversification; wellbeing; efficiency;
Specific subject area	New reclaimed lands (NRL); Egypt;
Type of data	Five tables with raw and analyzed/calculated data
How data were acquired	The household farm survey has been based on a structured questionnaire with quantitative and qualitative parameters;
Data format	Excel file with one table (data matrix) per sheet. Raw and analyzed/calculated data.
Parameters for data collection	The main conditions for starting the data collection at the household level were that the family head was present, preferably accompanied by his spouse and children. Three locations were privileged for data collection: at home, under the animal shelter, or in the border of the parcel. The family head and his wife were the primary respondents, even if some adult sons or girls have completed the information for specific activities. All the answers were filled on the paper support during the interviews.
Description of data collection	An Egyptian-French research team, including animal scientists, agronomists, and socio-economists, collected the data using a commonly structured questionnaire with closed, semi-opened, and open questions. The research team involved in the data collection entered the answers into a database developed on Microsoft Access.
Data source location	Institution: The French International center of agricultural research for development (CIRAD), the Egyptian Animal Production Research Institute (APRI) and International center for Agricultural Research in Dry Areas (ICARDA) City/Town/Region: Five zones in the Western part of Nile Valley: El-Nahda, El-Hammam, Banger, Tiba, and Bustan zone, along a gradient from the Northwest zone to the South (see fig. 1 below). Country: Egypt
Data accessibility	Repository name: CIRAD dataverse: https://dataverse.cirad.fr/privateurl.xhtml?token=c86e100e-c674–4110-bd82-cf0571b53a6d Data identification number: doi:10.18167/DVN1/UDTX1Y Provisional access before publication: https://dataverse.cirad.fr/privateurl.xhtml?token=c86e100e-c674–4110-bd82-cf0571b53a6d
Related research articles	Author's name: Véronique Alary, Samir Messad, Adel Aboul-Naga, Mona A. Osman, Taha Hosni Abdelsabour, Ehab Salah, Xavier Juanes Title: Multi-criteria assessment of the sustainability of crop-livestock farming systems in the reclaimed desert lands of Egypt Journal: Agricultural System DOI:10.1016/j.agsy.2020.102863

Table 1
Description of the sample.

Geographical zones	Total number of surveyed household farms	Number of surveyed large farms
Bustan	42	3
Tiba	35	4
Hammam	31	0
Banger	33	5
El-Nahda	34	5
Total sample	175	17

Value of the data

- The CLIMED dataset provides a complete description of the farm and off-farm activities at the household level to assess global indicators related to integration, diversification, efficiency, and wellbeing;
- The dataset can be used by research or public bodies to capture the diversity of farm systems and to work on sustainable innovations in the studied zones of Egypt;
- The information in the dataset about the family farm organization and activities can be used to support policy markers or development agencies in prioritizing and developing their operations for more sustainable development option of these rural zones;
- The dataset can be used as the basis to design and implement further agronomic or zootechnic experiments or to identify prototypes of farm systems to test innovations in the zone;

Data

As shown in Table 1, the survey was administered to 175 household heads representing the sample size used in the five selected zones of New Reclaimed Lands in Egypt. Among the sample, 90% (158) of them are small and medium land beneficiaries (with 1–2 ha, maximum), and the remained 10% (17) were composed of medium and large land farms who have invested in land or livestock in the zone. All of them have a livestock activity.

The three first tables (table 2–4) contain the raw data describing the household and family labor characteristics, the land access and size, and the animal stock per species. These tables are mainly extracted from the set of raw data. Tables 5 and 6 give the calculated data compiled to assess the sustainability of the family farms based on indicators related to the degree of diversification and integration (Table 5) and indicators of wellbeing and efficiency (Table 6).

Experimental design, materials, and methods

The household farm survey has been implemented following an exploratory field study based on open interviews with agricultural technical staff working in the zone and farmers. This exploratory study allowed identifying the critical criteria of diversity (notably regarding the type of land access and livestock size) and the sampling protocol along a gradient of settlement in the zone (See Fig. 1, [1,2]). So, five zones have been chosen according to the date of land reclamation and settlement: from the reclaimed lands settled in the sixties located in the Southwest of Alexandra (El-Nardha) to the newly reclaimed lands settled at the end of the nineties in the Tiba and Bustan extension zones. In-between, two zones have been considered: Sukhar-el-Bangar (called here 'Bangar') reclaimed mainly in the eighties and Hammam in the nineties. Except for the Bustan zone, three villages have been selected to reflect the diversity of land beneficiaries in each zone. In the Bustan zone, a fourth selected village allowed to consider the particular case of a village settled by graduates. In the two more recent settled locations (i.e.,

Table 2
Main variables describing household characteristics.

Short name of the variable	Full name of the variable	Content of the variable	Range preview Min - Max*
Edu_H	Education of the family head	By educational level: 1. No read no write; 2. Coranic school; 3. primary school; 4. Secondary school; 5. High school or professional school	2.6–4.8
Age_H	Age of the family head	Number of years	45.5–54.3
Fs_hh	Family size	Number of persons	6.7–11.1
Per_school	Schooled children/total children number in the family	%	40%–70%
Fw_child_nschool	Number of children out of school who work in the farm	Number of persons	0.1–0.3
Amw_hh	Number of potential male workers in the family (more than 16 years old and no schooled)	Number of persons	2.4–3.2
Afw_hh	Number of potential female workers in the family	Number of persons	0.5–1.3
Tw_out	Number of workers from the family working outside the farm	Number of persons	0.4–0.7
Tw_out_pot	Number of workers from the family working outside the farm and persons looking for a job	Number of persons	0.7–1.3

* Min and Max are the minima and maximum of the mean by zone

Table 3
Main variables describing the land system (access and size).

Short name of the variable	Full name of the variable	Content of the variable	Range preview Min - Max
Atot	Total area owned by the family	Feddan*	3.10–9.1
Acult	Total seasonal area use for the crops by the family	Feddan*	6.9–17.8
Prent	Percentage of rent area / seasonal cultivated area (AA)	%	1%–19%
Area_purch	Land purchased since the arrival	Feddan*	1.7–4.9
Area_ben_grad	Land access as beneficial or graduate	Feddan*	1.2–3.8

* One feddan = 0.42 ha.

Table 4
Main variables describing the livestock system.

Short name of the variable	Full name of the variable	Content of the variable	Range preview Min - Max
TLU_farm	Number of Total Livestock Unit (TLU*) per farm	TLU	6.1–24.5
Fat_TLU	Number of fattening large ruminant in the farm	Heads	0.7–6.8
Dairy_farm	Number of dairy large ruminants per farm (buffaloe, local cows, and crossbred)	Heads	2.03–8.6
Perbuff_dairy	Percentage of dairy buffaloes per farm/ total dairy animals	%	16%–49%
Percross_dairy	Percentage of dairy crossbred per farm/ Total dairy animals	%	32%–62%
SR_head	Number of small ruminant per farm	Heads	0.57–6.3

* Total Livestock Unit (TLU) of 250 kg live weight.

Table 5
Description of the synthetic variables for assessing diversification and integration at the farm level.

Short name of the variable	Full name of the variable	Content of the variable	Range preview Min - Max
Receipt_Anl_perc	% animal cash flow / total family cash flow	%	29%–37%
Dairy_totprod	Percentage of dairy products/ total animal production (in value)	%	3%–9%
FeedPur_Tlu	Purchased feed cost (inc. concentrates) per TLU per year	EGP/TLU	1202–1977
FodderPro_Tlu	Self-produced fodder cost per TLU per year	EGP/TLU	352–859
ConcPur_Tlu	Concentrate cost per TLU per year	EGP/TLU	897–1791
Selffeed_cost_perc	Production cost for fodder/total feed costs (produced and purchased)	%	24%–39%
N_org_perc	Organic nitrogen (N)/ total Nitrogen supply (chemical and organic)	%	29%–49%
Perc_Nfarm	On-farm Nitrogen supply/Organic nitrogen supply	%	33%–92%
FWU	Number of family workers on the farm	Full-time work unit	2.6–3.8
AW_tot	Number of salaried agricultural workers (Number of days of agricultural workers /260 days/year)	Full- time work unit	1.2–5.6
WAWU	The salaried workforce in the total farm workforce	%	23%–45%
AWU	The family and salaried workforce in the farm	Full- time work unit	3.8–8.6
Pfodder	Total area cultivated with fodder per year	% TAA*	10%–22%
Ptree	Total area cultivated with tree crop per year	% TAA	0%–67%
PAnnualCrop	Total area cultivated with annual crops per year	% TAA	5%–28%
Pwheat	Total area cultivated with wheat per year	% TAA	8%–27%
Pmaize	Total area cultivated with maize per year	% TAA	9%–24%
Pcashcrop	Total area cultivated with cash crop per year	% TAA	1%–28%

* TAA for Total Agricultural Area).

Tiba and Bustan extension), it is usual to distinguish “graduates” and “common beneficiaries” village. In each village, ten farmers have been selected based on the method of snowball sampling [2] and respecting a certain proportion of very small, small, and medium farms regarding livestock size. One hundred fifty-eight farmers have been surveyed in 2013/14. We added 17 large farmers settled in the region to understand the global dynamics in the different zones. The total sample counts 175 farms.

We organized the household farm survey with an appointment with the heads of the household. Generally, the local technician contacted a set of farmers (according to the criteria given in our protocol), and we organized a joint meeting in the meeting room of one local association or of one farmer. The research team introduced to the farmers the research project, its objective, and the expectations of the household farm survey. This presentation allowed us to have a general discussion about the main constraints or opportunities in the studied village.

The French-Egyptian research team was composed of 8 researchers. In the majority of cases, a group of two researchers followed one farmer at his house to conduct the interview and fill the questionnaire.

The household farm survey has been based on a structured questionnaire organized on six parts (See the supplementary file with the questionnaire):

Table 6
Description of the synthetic variables for assessing wellbeing and efficiency at the farm level.

Short name of the variable	Full name of the variable	Content of the variable	Range preview Min - Max
Net_inc	Gross margin per feddan	EGP/feddan	27,721–170,214
Net_inc_FWU	Net income/ familial work unit	EGP/family work unit	25,332–89,229
Net_inc_salmin	Net income/ minimum govermental salary (1200 EGP/month*12 months)	ratio	4–12
Net_inc_cap	Total net income per Total family members	EGP/person	7736–21,427
Anl_CF_FarmExpenses	Meat and milk income per total family and farm annual expenses	%	47–67%
Employement_Ruminant	Ruminant net income/ minimum salary (fixed at 1200 EGP per month)	ratio	0.75–2.22
NutFam_P	Protein supply/family protein needs based on FAO requirement i.e., 60 g/person/day)	%	26–38%
Milk_CF_capitaneeds	Milk daily income/minimum family daily monetary needs	%	12–39%
Trans_farmjob	Number of feddan/total workforce (AWU)	ha	1.01–1.76
Trans_family	Farm capital (Owned land value and livestock capital at selling price) divided by the number of children	EGP	45,537–122,016
Net_inc_fed	Net income per feddan	EGP	12,323–32,085
Profit	Net income / total product	%	36–48%
Bov_inc_K	Meat and dairy net income/livestock capital	%	25–134%
Eff_feed_liter	Total feed costs/ Milk production	EGP/liter	1.52–2.95
Milk_yield_liter	Total milk production per dairy animal per year	liter/head/year	1217–1530
AAdairyprod_fed	Total milk production per feddan of fodder crops (mainly, maize and berseem)	liter/feddan	2034–6513

Note: Economic and financial indicators are related to 174 farmers. One farmer with an intensive poultry farm has been removed from the sample.

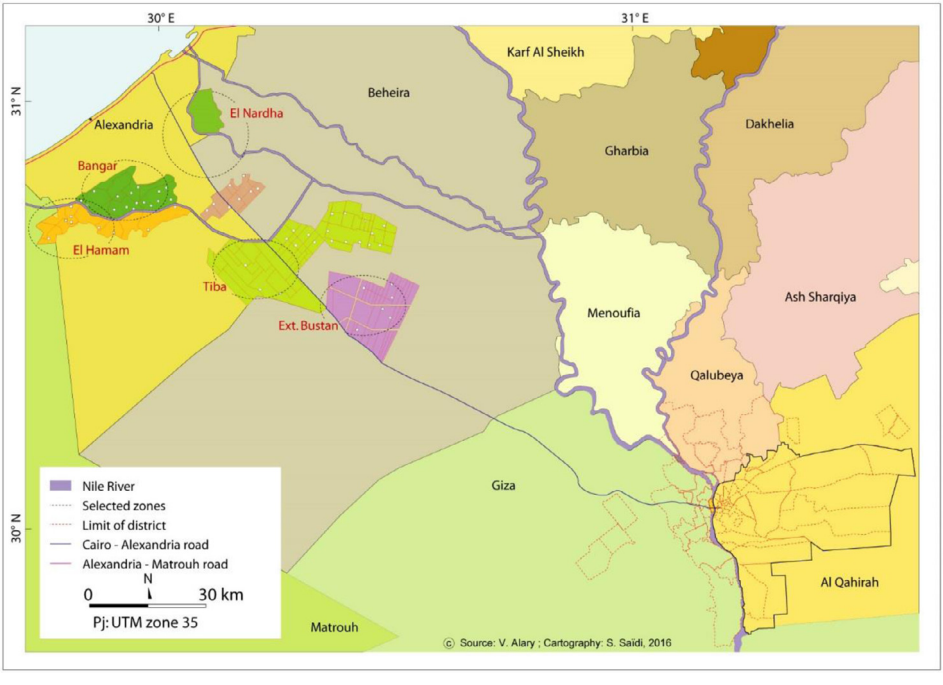

Fig. 1. The geographical location of the five selected areas in the western part of the Nile Delta (Egypt) (Alary et al., 2016, [3]).

- Part 1: Family and house description to assess the family living conditions
- Part 2: Land and crop system. This part consists of a story and description of the land access and crop management over the seasons;
- Part 3: Livestock structure and management including the feeding system, animal movements (inc. livestock transactions), animal performance and health care;
- Part 4: Mode of funding (formal or informal credit or donation);
- Part 5: Main changes during the last ten years;
- Part 6: Social capital, including family and professionals networks.

According to the composition of the research group, the questionnaire was filled in Arabic or English. The survey was conducted from March 2013 to February 2014.

After each session of fieldwork, two researchers were in charge of data entry at the research office. This data entry has been organized on Microsoft ACCESS. A storage database and input screens specific to this survey had been developed. This information system thus guaranteed the coherence of the data and their integrity through an Information Technology (IT) structure. A data checking has been done from June 2013 to February 2014 using cross-checking variables, statistical tests (mainly based on the distribution for each variable), and tests of coherence (e.g., the cropland allocation according to land access). A systematic return to each farm has been organized from May to September 2014 to validate or to correct incoherent data. All the questionnaires in paper forms are available at APRI (Animal production research institute) in Egypt.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships which have, or could be perceived to have, influenced the work reported in this article.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.dib.2020.105879.

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