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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\textbf{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...
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 declared 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 Hamman 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
|-------------------------------------|------------------------------------------------------------------------------------------|-------------------------|---------------|
| 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       |
| P fodder                            | Total area cultivated with fodder per year                                                | % TAA                   | 10%–22%       |
| P tree                              | 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 farms 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 governmental 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        | Ruminant net income/ minimum salary (fixed at 1200 EGP per month)                         | ratio                                       | 0.75–2.22               |
| Employment_Ruminant        | Ruminant net income/ minimum salary                                                       | 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                                                  | %                                          | 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%                  |
| Boy_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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