



# Country Pastoralism and Small-Scale Farming Profile – Egypt



## ACKNOWLEDGEMENT

The Country Pastoralism and Small-Scale Farming Profile development exercise primary objective was to identify the current status of the governance landscape for pastoralist and small-scale farming in Egypt.

The SLGA program supports the implementation of the AU Agenda on Land, in addition the program is part of the BMZ unique initiative **‘One World, No Hunger**. This programme will have immense contribution to the initiative under the Action Area “promoting responsible land use and improving access to land”. The SLGA aims to strengthen the human and institutional capacities required to realise sustainable land policies that recognise the rights of marginalised groups such as small scale farmers, pastoralists, youths and women across Africa. One of the main areas of action for SLGA is the establishment and coordination of the Network of Excellence on Land Governance in Africa (NELGA) under the leadership of the ALPC (African Land Policy Centre).

This study generated evidence to inform SLGA’s capacity to provide advisory support on such issues to decision makers and other stakeholders. This information will contribute to the body of literature available on the Land Governance Agenda of the AU to improve land governance in Africa.

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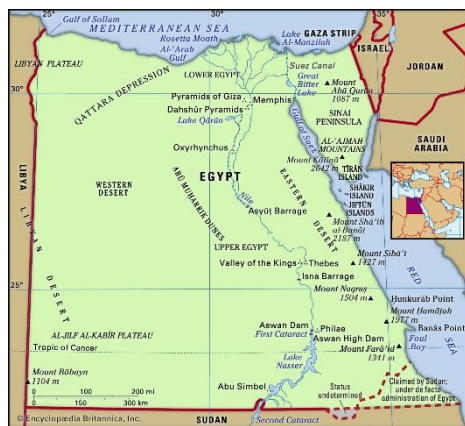
## ACRONYMS AND ABBREVIATIONS

<b>°C</b>	: Degrees Celsius
<b>ARC</b>	: Agriculture Research Centre
<b>ARL</b>	: Agrarian Reform Law
<b>EGP</b>	: Egyptian Pound
<b>ESA</b>	: Egyptian Survey Authority
<b>FAO</b>	: Food and Agriculture Organization of the United Nations
<b>FAOSTAT</b>	: Food and Agriculture Organization Statistics
<b>FCRI</b>	: Field Crop Research Institute
<b>GARPAR</b>	: General Authority for Reconstruction Projects and Land Reclamation
<b>GDP</b>	: Gross Domestic Product
<b>GEF</b>	: Global Environment Fund
<b>HERD</b>	: Healthy Ecosystems for Rangeland Development
<b>IFAD</b>	: International Fund for Agricultural Development
<b>ITPGRFA</b>	: International Treaty on Plant Genetic Resources for Food and Agriculture
<b>IUCN- ROWA</b>	: International Union for Conservation of Nature and Natural Resources, Regional Office for West Asia
<b>LCHR</b>	: Land Center for Human Rights
<b>MALR</b>	: Ministry of Agriculture and Land Reclamation
<b>MEAs</b>	: Multilateral Environmental Agreements
<b>NRLC</b>	: National Rangeland Committee
<b>NSSD</b>	: National Strategy for Sustainable Development
<b>NYC</b>	: National Youth Council
<b>REPD</b>	: Real Estate Publicity Department
<b>SSF</b>	: Small Scale Farmer
<b>USAID</b>	: United States Agency for International Development
<b>USD</b>	: United States Dollar
<b>USOIG</b>	: United States Office of Inspector General

# 1. COUNTRY AND MACROECONOMY

## General data

Egypt is found in the north-eastern corner of Africa and shares borders with Libya to the west, Israel to the north-east and Sudan to the south. (Fig 1). Egypt has a total area of 1,001,450 km<sup>2</sup> and a total coastline of 2,450 km. About 96 percent of Egypt's total area is desert and only 3.5% of the total area is arable land, concentrated around the fertile Nile River alluvial deposits. About 0.5% of the total land area is occupied by rugged mountainous terrain along the Red Sea, the extreme southwest of the Western Desert, and the southern Sinai Peninsula (Baker et al., 2022).



The climate of Egypt is dry and hot, typical of north African Mediterranean desert climate. Winter lasts from November to March and summer from May to September. Winter temperatures are mild and cool, while summer temperatures are hot. In the coastal regions, average maximum temperature ranges between 14°C in winter and 30°C in summer. Temperatures vary widely in the inland desert areas. In summer, temperatures range from 7°C at night to 43°C during the day and 0°C at night and 18°C during the day, in winter. Egypt also experiences hot windstorms, known as “khamsein”, which carry

sand and dust, sweep across the northern coast of Africa between March and May, and can increase the temperature by 20°C in two hours and last for several days<sup>1</sup>. Egypt is highly arid, with very little and highly variable annual precipitation, which falls in winter. Precipitation decreases sharply from north to south, with Alexandria in the north receiving, on average 175 mm of rainfall per annum, Cairo, 25 mm, and Aswan in the south 2.5 mm.

The population of Egypt was 104 million in 2021<sup>2</sup> and currently (Nov 2022) is estimated to be 106.2 million<sup>3</sup>, with a growth rate of 1.8%. About 95% of the population live along the banks of the Nile and its delta, holding 1,540 persons per km<sup>2</sup>, as compared to 96 persons per km<sup>2</sup> for the whole country. About 51.2% of Egyptians are under the age of 25, with just 4.3% over the age of 65, making it one of the most youthful populations in the world<sup>4</sup>. Life expectancy is 70 years for males and 75 years for females<sup>3</sup> and the literacy rate is 75.34%<sup>5</sup>

## Socioeconomic indicators

Egypt's GDP for 2021 was 404.142 billion USD<sup>6</sup>, with GDP per capita of 4085.62 USD<sup>7</sup>, thus it is classified as a lower middle-income economy by the World Bank. In 2021, agriculture contributed around 11.83% to the GDP of Egypt, 30.79% came from the industry and 52.23% from the service sector. The unemployment rate was 9.17% in 2020 and reached 9.33% in 2021 for the whole population, and 21.25% for youth and 24.28% for women. The poverty rate fell from 32.5% in 2018 to 29.7% in 2021, but rural people (32.5 %) remain among the poorest in the country, especially in Upper Egypt.

<sup>1</sup> <https://climateknowledgeportal.worldbank.org/country/egypt/climate-data-historical>

<sup>2</sup> <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=EG>

<sup>3</sup> <https://www.unfpa.org/data/world-population/EG>

<sup>4</sup> "population clock". Egypt Central Agency for Public Mobilization And Statistics.

<sup>5</sup> <https://countrymeters.info/en/Egypt>

<sup>6</sup> <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=EG>

<sup>7</sup> <https://tradingeconomics.com/egypt/gdp-per-capita>

<sup>8</sup> <https://www.fao.org/3/i9729en/i9729en.pdf>

## **Agriculture and Livestock**

The Egyptian economy relies heavily on agriculture for food, feed, fiber, and other products. It provides livelihood for about 55% and employs around 26% of the labor force, contributes approximately 12% of the GDP and 20% of all foreign exchange earnings. Owing to its aridity, only 3.5% of the total land area of Egypt, in the Nile alluvial plain and delta, amounting to 3,365,000 ha as the total cultivated area, with approximately 2.7 million ha under intensive irrigated production and 1 million ha under permanent or perennial crops<sup>8</sup>. Annual field crops contribute 75% of the total value of agricultural products in Egypt, while the rest comes from livestock products, fruits and vegetables, and other specialty crops. Cotton is the main summer field crop, and notably Egypt is the largest producer of long staple cotton in the world, supplying 33% of total world output. Other principal annual summer crops include maize, rice, sugar cane and fava (broad) beans. The main annual winter crops are wheat, clover, or berseem (*Trifolium alexandrinum*), a fodder crop. Minor winter crops are, amongst others, pulses, barley, and sugar beet.

Poultry contributes 10% of agricultural value added, with the country producing over 1 million tons of poultry meat. Cattle and buffaloes make up about 23% of total agricultural value, a total of 73.5 billion EGP of which 66% is meat production and 34% milk production

## **2. SMALL SCALE FARMING**

### **General characteristics**

According to Aboulnaga et al. (2017) there is no common agreement on the definition of small-scale family farming, or small farm holders, among the stakeholders in Egypt. Such a definition should not be limited to the farm size alone. It should consider the criteria of economic scale and productive efficiency in use of the natural resources as well as income generated from land and herd/flock and its adequacy to the needs of the family members and to keeping them out of poverty. Accordingly, farm holders with less than

three feddans (1.26 ha), and landless farmers, fall within the “small-scale holders” category and are part of the SSF system. This definition conforms to Egyptian law which exempts holders of less than three feddans from real estate taxes on agricultural land, considering them low-income small-scale farmers.

Aboulnaga et al. (2017) further characterised small-scale farms in Egypt as those using traditional patterns of production technologies and marketing systems, which are less developed than large scale farming, where there is absence or weakness of regulatory frameworks which would enable them to claim their rights, defend their interests and participate in the formulation of economic, social and political policies. and exhibiting high resistance of the younger generation to participate in agricultural activities. Small-scale family farms in Egypt were described as labor intensive, requiring 3 laborers per feddan, compared to 0.7 laborers per feddan for the medium and large-scale farms, reflecting low labor productivity and high rates of disguised unemployment in SSF system. There are higher rates illiteracy among small scale farmers (32%) compared to large scale farmers (22%). Access to off-farm sources of income is lower for small-scale farmers than large-scale farmers. Nearly half of smallholders work only in agriculture, have no additional income source, and own less assets (5000 EGP) compared to large scale commercial farmers (+50 000 EGP) on average.

Smallholdings comprise about 35 percent of all agricultural land in the country and smallholders produce around 47% of field crops, 61.3% of large ruminants, 59.3% of small ruminants and a smaller portion horticultural crop (Aboulnaga et al., 2017). For poultry farmers in Egypt, flock size varies from 10- 5 000 for the small-scale producers up to 100 000 for large scale integrated producers. Over 80 percent of Egypt’s poultry are kept in intensive systems by large scale farmers who contributes about 84 percent of total poultry meat production in Egypt, producing about 850 000 tons per year, and small-scale farmers produce 16%.<sup>9</sup>

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<sup>9</sup> <https://www.fao.org/documents/card/en/c/18477EN/>

## *Role and place of women*

There is evidence of increasing levels inequality in land ownership patterns by gender within the SSF system in Egypt. The percentage of female landholders decreased from 9.8 percent in 1990 to nearly 4.3 percent in 2010, even though they represent more than 50 percent of Egyptian population (Aboulnaga et al., 2017). The engagement of Egyptian women in agricultural and related activities, including irrigation and water management, is significant, accounting for almost 45 percent of the official workforce, while more than 50 percent are engaged informally in fertiliser application, irrigation, weeding, harvesting, post-harvesting, animal care, sacking, marketing, and storage of agricultural products. However, the economic contribution of women to agricultural and irrigation activities and to the livelihoods, well-being and food security of families and communities is often unrecognised, invisible, and mostly undervalued. Culture and prevailing gender and social norms play a significant role in shaping gender identities, roles, and responsibilities, influencing access to and control agricultural and water resources. In Egypt, women are mostly assigned housekeeping responsibilities, unpaid jobs, and care work, and this in turn hinders their ability to engage in paid work or education, or to be seen as main contributors to rural development rather than “helpers” of their male relatives (FAO, 2022). Men underestimate women’s preferences for owning immovable property (land and housing) and women who acquire land remained hesitant or unwilling to enable their daughters to inherit land at par with their sons, evidence of the influence of religious and traditional culture as important factors in determining asset ownership and control patterns by men and women in Egypt, like in other middle eastern Islamic countries (Najjar et al., 2020), with Sharia laws and traditions. Most women farmers are widowed (70 percent) and have generally a smaller piece of land to cultivate (1.4 feddan against 3.5 for men). Women farmers mainly farm for household

consumption (FAO, 2016). In most cases, women are traditionally excluded from management systems: even when holding land, they are expected to send male representatives to meetings rather than attending themselves (USAID, 2001).

## *Role and place of youth*

There is no standard definition or age range for youth in Egypt. According to the National Council for Youth (NYC), which preceded the current Ministry of State for Youth Affairs defined youth as aged 18-30 years of age. However, some recent ministry programs define youth in Egypt as 18-35 years of age<sup>12</sup>. On the other hand, a document issued from the Supreme Council for Youth and Sport in May 1996 considered youth as being from 6-30 years old. The NCY differentiates between two groups: the age group from 6-18 years old (teenagers and children) and from 18- 30 years old (Youth).

The unemployment rate in Egypt reached 11.4% in 2018, while youth unemployment increased to 32.5 per cent compared to 24.4 per cent in 2010.<sup>10</sup>. An overhanging gender dimension shows that youth unemployment for women, especially in rural areas, where smallholder farmers are found in Egypt, is far worse than for young men. For example, youth unemployment was 30.1%, 23.5% for men and 50.59% for women<sup>11</sup>, in 2013, largely underpinned by social-cultural and religious norms that restrict women from actively seeking and participating in paid work outside their homes. Aboulnaga et al. (2017) report high resistance of the younger generation to participate in agricultural activities as one of the distinguishing characteristics of small-scale agriculture in Egypt. Agriculture is no longer attractive to family members as a form of permanent work, especially for young family members, who prefer to move towards non-agricultural activities as permanent work whenever such opportunities exist. This observation was buttressed by a clear increase in temporary laborers/feddan among the different

<sup>12</sup>

<https://www.youthpolicy.org/factsheets/country/egypt/>

<sup>10</sup>

<https://www.ifad.org/en/web/operations/w/country/egypt>

<sup>11</sup> [https://www.ilo.org/africa/technical-cooperation/WCMS\\_243614/lang--en/index.htm](https://www.ilo.org/africa/technical-cooperation/WCMS_243614/lang--en/index.htm)

categories of land tenure, especially among SSFs recorded by Abounaga et al. (2017).

### *Assessment of available research on small-scale agriculture*

Research on small-scale agriculture in Egypt is not extensive, perhaps reflecting the strong emphasis on maximising yield of crop and animal products per unit area, which has been the preoccupation of the research and extension nexus for many years. As a result, agricultural research and development priorities have traditionally been similar for small-scale and large-scale commercial agriculture, to generate recommendations to maximise output and/or increase efficiency of applied inputs such as water for irrigation and fertiliser on productivity.

However, there is evidence of key research outputs on the state of social and economic conditions and factors affecting livelihoods and food security of SSFs in Egypt including Abounaga et al. (2017), El-Enbaby et al. (2019), and FAO, 2022. Abounaga et al. (2017) defined and characterised small-scale farmers in Egypt with regards to typologies of small-scale farming, land tenure, demographic and cultural characteristics, crop and animal production, economic and social contribution to economic development, access to markets and other producer organisations and trajectories with regards to population growth and structure, and the legal and policy framework supporting SSFs in Egypt. El-Enbaby et al. (2019) characterised smallholder farm households in Upper Egypt based on data from a comprehensive farm household survey. The results from the descriptive analysis in combination with findings from the global literature provided recommendations on how agricultural projects can be leveraged for improving nutrition. FAO (2022) examined the gender, water and agriculture nexus in Egypt and provided recommendations on how women's meaningful participation in agriculture, irrigation and domestic water can be enhanced for SSFs.

### *Public policy in support of small-scale farming*

The Agrarian Reform Law (ARL) of 1952 limited the upper limit of ownership of agricultural land to 100 feddans per family and to 50 feddans per individual. The application of these laws freed up large areas of agricultural land to be redistributed to landless farmers and poor social groups. This led to significant changes in the structure of the acquisition of agricultural land. As a result, the percentage of land area within the larger holdings category (50 feddans or more) dropped from 50.5 percent in 1929 to 12.7 percent in 1980. On the contrary, number of holdings with less than five feddans increased from 19.2 percent in 1929 to 52.5 percent in 1980. One of the most important policies for reducing poverty and unemployment and empowering the rural poor is the land allocation policy of the newly reclaimed areas. In the new land reclamation projects, the trend is for 30 percent of the land area to be allocated to smallholders from various social classes. Small farmers, as well as other vulnerable groups, receive different types of direct support, such as subsidised bread, ration cards for subsidised food commodities and subsidised energy. The greatest single benefit for farmers holding less than three feddans is the exemption from agricultural land tax. Subsidised loans and fertilisers represent another type of direct subsidy provided to small farmers and to farmers in general. The implementation of health insurance programs for farmers, the creation of a legal framework for contract farming, the establishment of a farmers' pension scheme and the enactment of agricultural insurance laws, represents recent government policy initiatives to support the livelihoods of SSFs (Abounaga et al., 2017).

### *Access to land and land governance*

In Egypt, land property rights are the result of convergence of common factors, such as religion (i.e., Islam as common religion) and remnants of legal systems from Egypt's colonial masters. Land property rights are multiple and complex. They are inherited from pre-Islamic rules (Orf), Islamic (Sharia) and colonial as well as post-colonial legislation. Ownership of land may be secured



through inheritance or purchase. Land may also be leased from the government or private owners. The government also grants types of land to private individuals and entities, for example through reclamation projects or in some cases through granting rights to squatters (Ziadeh 1978). Egypt applies two systems for registering properties: a title registration system and a deeds recordation system. The title registration system (called *sejel ainee* and introduced by Law 142 of 1964), whose application began in 2006, is applied in rural areas. The government estimates that 70–80% of agricultural lands are covered by the title system. The deeds recordation system (called *sejel shakhsee* and regulated through Law No. 114 of 1946) historically covered the whole country but is now primarily in use in urban areas<sup>12</sup>.

There are five types of land tenure in Egypt. **Private ownership or freehold title:** Freehold land is land registered with the local district office of the Land Registration Division and owned by private persons or companies. **Public ownership:** Land registered as state property and not leased to a private entity is publicly owned. Land under public ownership falls into two categories: —state domain, which includes desert or unclaimed lands and is administered by the governorate; and public domain, which serves a public utility such as rivers, roads, military installations, land for antiquity sites, and land set aside for development. **Publicly leased land:** Land owned by the state can be leased on a long-term basis to its occupants. These leases apply in a number of circumstances, most importantly for land in reclaimed areas and for squatters (through a request to the governorate). **Trust or Waqf land:** Trust land is land set aside by the state for charitable or religious purpose and usually administered by the Ministry of Waqf. **Encroachment (Wad Al Ayad):** The Civil Code makes it possible for the possessor or user of a plot of land to gain ownership of that land if it is occupied continuously for 15 years without the owner asserting rights (Madbouly 2005; El-Hefnawi 2005; FAO 2000; Ziadeh 1978; UN-Habitat 2007).

The Ministry of Agriculture and Land Reclamation (MALR) is charged with protection of agricultural

land in Egypt and has responsibility over agricultural land and water. For desert lands, the General Authority for Reconstruction Projects, and Agricultural Reclamation (GARP) is the main governmental body responsible for managing, developing and disposing land for agricultural and reclamation purposes. GARP, which reports to the Ministry of Agriculture and Land Reclamation, controls lands slated for reclamation and arable lands within villages that are not privately owned. The governorate controls desert lands within village boundaries and adjacent lands up to two kilometers outside of the village, unless the land is earmarked for national use (Madbouly 2005). The Real Estate Publicity Department (REPD) of the Ministry of Justice manages the existing deed-recording process (Rabley 2008). The Land Registry Office and the Egyptian Survey Authority (ESA) under the Ministry of Water Resources and Irrigation are responsible for maintaining land records and for official surveys, mapping and cadastral work. Also, the Ministry of Communications and Information Technology assisted with collating maps and real estate details into a central database, to fully automate the land records system (Taylor 2005; GOE 2009; World Bank 2008). The Ministry of Waqf controls land designated as waqf (Madbouly 2005).

Disputes over rural land are common in Egypt. Frequent causes of disputes include contested land ownership and inheritance claims, contested land boundaries, and issues concerning irrigation. Conflicts over land ownership rights increased in the wake of Law No. 96 which reversed two key components of the 1952 reforms by increasing rents and eliminating permanent, heritable rights of tenants thus disposing millions of poor small-scale farmers of their land rights. The Egyptian NGO Land Center for Human Rights (LCHR) has documented numerous annual deaths, injuries and arrests related to implementation of the law through 2003, and international news reports stated that land-based disputes were on the rise in 2005. The Civil Code allows land disputes to be adjudicated by the courts. Possession, ownership and other real rights in immovable property are

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<sup>12</sup> <https://www.land-links.org/country-profile/egypt>

regulated by the law of the place in which the immovable property is situated. In the absence of an applicable law the judge will base his decision on custom, and, in the absence of custom, on principles of Muslim law. The courts are of limited use to the rural poor, however, many of whom understand neither the legal/judicial process nor their rights to land. Illiteracy in rural areas further minimises access of the poor to the formal court system, as does the inability to pay court-related expenses<sup>12</sup>

The 1971 Constitution guarantees equality to all citizens and confirms women 's rights to inherit and own property. Ownership rights in Egypt are governed by the Civil Code, which affirms women 's rights to own, inherit and independently use property. However, tradition in Egypt dictates that property, contracts and leases should be managed by the father or husband; information on women 's legal rights to land is lacking; and male household members often buy out or usurp women 's rights. The government estimated in 2000 that 96% of landowners were male (Freedom House n.d.; LCHR 2004; Nazir and Tomppert 2005). Women 's rights to property are very insecure. A widow may choose not to marry or choose to remain in her house after their husband 's death to strengthen her and her children 's claim to inherit it. Traditionally men own homes or other buildings, and traditional dictates that men are responsible for providing for their families. While women may inherit a home, there is incredible social pressure to give it to her male relatives. In the case of a property dispute over this matter, traditional authorities will often favor men (FAO, 2010).

### *Climate change and small-scale farming*

Egypt is one of the world's most vulnerable countries to the potential impacts of climate change, with Upper Egypt (including Southern and Middle Egypt) being particularly vulnerable. Studies conclude that this whole region will be subject to a temperature rise of 1.5-2 degrees by 2040. On top of that, there is an evident increase in intensity and frequency of extreme weather events such as heat and chill waves as well as

strong wind episodes. Climate change is expected to increase stress on the already strained water resources in Egypt. The projected temperature increase will increase evapotranspiration and crop water requirements of strategic crops are expected to increase by 6 to 16%. Higher temperatures will also increase the frequency and severity of pest and disease and disease outbreaks, increasing losses for poor and vulnerable SSFs. The depredations of invasive species, Fall Armyworm (*Spodoptera frugiperda* (J.E. Smith) and the tomato leaf miner (*Tuta absoluta*), and their devastating negative impacts on cereal and tomato yields and livelihoods of farmers, are predicted to increase with rising temperatures. Increases in incidences and severity of Blue Tongue disease and Rift Valley Fever have been linked to rising temperatures in southern Egypt and the negative impacts of heat stress on growth rate and reproduction in farm animals and fodder growth and yield is expected to put a further damper on the productivity and profitability of integrated livestock and cropping systems in Egypt (Ministry of Agriculture and Land Reclamation, 2020). A rise in sea level could affect the living conditions of millions of people, especially those living in the Nile Delta and the southeast, meaning that the populations of this part of the coastal zone could be exposed to economic, social, and/or health risks (Leach et al., 2013).

In a study of climate change adaptation in the Nile Delta (Kassem et al., 2019) reported that more than half (51.9%) of study respondents had no knowledge about the climate change phenomenon and maximising the use of manure, changing crop patterns, and crop rotation were the adaptation measures most adopted by aware respondents, against climate change. Awareness of the importance of climate change action both domestically and at the global level is fast increasing in Egypt. The country is at a turning point in its commitment and action to tackle the consequences of climate change. In the [2030 Vision](#) and its sustainable development strategy, Egypt has made commitments to integrate climate change in national development policies and to progressively green its budget across sectors.

### *International and regional cooperation in support of small-scale farming*

USAID has spent nearly US \$1.3 billion on the agricultural sector in Egypt over the past three decades, including efforts to extend credit to small farmers, improve irrigation systems and water-use efficiency, and increase productivity and farmer incomes. Most recently, USAID has focused on real-estate finance reform, including professionalising originating mortgages, modernising real estate financing instruments, developing a dependable property registry, and establishing a credit information service (USAID 2004; Rabley 2008; USAID 2010a; USAID 2010b; USOIG 2009). The International Fund for Agricultural Development (IFAD) has financed US \$250 million in projects in Egypt, with a focus on improving agricultural production and reducing poverty in both long-settled and newly settled areas. IFAD 's recent projects provide post-settlement and agricultural support services to smallholder beneficiaries of Egypt 's land reclamation projects and include a strong gender component. In 2010, IFAD launched a US \$48 million project aimed at increasing water-use efficiency and crop production on small farms (IFAD 2007; IFAD 2010).

### **3. PASTORALISM**

#### *General characteristics*

Pastoralism is the extensive livestock production system that involves the tracking and use of grazing and water across a given landscape (normally a "rangeland"). Normally practiced in dryland areas, mobility is key to this system. Pastoralists are people who practice pastoralism as a livelihood system. More precisely, pastoralists can be categorised as those groups of people that derive 50 percent or more of their food and incomes from livestock and livestock products through an extensive livestock system which involves movement of livestock and people to take advantage of ephemeral (lasting for a very short time) concentrations of resources typical for rangelands, where vegetation and water availability is highly variable and short-lived (Behnke et al., 2011). They can therefore be defined as a

specialised production system that "takes advantage of the characteristic variability of most rangeland environments, where key resources such as nutrients and water for livestock can be relied on in the form of unpredictable and short-lived concentrations more than in uniform and stable distributions" (Krätli et al., 2013). There are three types of pastoralism, nomadic pastoralism, transhumance, agropastoralism. Nomadic pastoralists move together with their livestock to exploit availability of grazing and watering resources without any predetermined pattern. Transhumance involves a fixed pattern of movement of animals according to season and therefore availability of water and grazing resources at various locations. In mixed-cropping semi-extensive systems, agropastoralism is more common, as the pastoralists may herd animals in areas surrounding their permanent settlements but are sedentary to facilitate crop production in an integrated crop and livestock production system. In his treatise titled "Pastoralism in Roman Egypt", Keenan (1989), presents evidence of keeping and herding of goats and sheep (small ruminants) in registers of animal ownership and other documents kept by central authorities on papyrus scrolls in Roman Egyptian times.

In the context of Egypt, agropastoralism is practiced by the highest proportion of smallholder and large-scale farmers along the banks of the Nile and in the Nile Delta, where the highest concentration of human settlement is found, and complimentary fodder and crop residues are available, to support this integrated crop livestock system of production. On the fringes of these settled areas and extending into the harsh desert environments are semi-nomadic and nomadic pastoralists, as dictated by a gradient in availability water and feed resources and hence increasing extensification of livestock productions systems. In total, 8.6 million large ruminants are found in Egypt, of which 43% are buffaloes and 57% are cattle. Production of milk from buffaloes contributes about 47% to the total national milk production, while cattle contribute 51%. Buffaloes contribute about 41% to national meat production and cattle contribute 43% (FAOSTAT, 2016). About 97% of the Egyptian buffalo population is raised in small size herds within semi-intensive

traditional mixed crop-livestock production systems, which is the main livestock production system in Egypt. About 57% of Egypt's buffalos are kept in Delta, in northern Egypt, while 43% are kept in Middle and Upper Egypt in the southern part of the country (Fahim et al., 2018). There are more than three million goats in Egypt, raised primarily in three regions: the Upper Egypt, Nile Delta, and in the desert rangelands (FAOSTAT, 2011). Sheep populations mimic goat populations. Nomadic pastoralists also keep camels (one million two hundred) under extensive management for milk, meat, and transport.

### *Role and place of women*

Gender division of labor in nomadic pastoral societies varies across regions. Men are largely the decision makers for livestock production and oversee general herd management. Their management responsibilities require constant attendance at markets and other gathering places to obtain information on range conditions, water availability and incidence of diseases. Men make initial decisions on when to move, where to move to, and who to herd the stocks. Women are responsible for milking, processing of milk and marketing of surplus milk and dairy products. In areas where they are restricted in mobility by pregnancy and raising children, religion etc., women take care of stock kept near the camp, requiring particular attention such as pregnant cows, newly born calves, injured and sick animals. Women ensure that calves have ample suckling time and supply fodder to them. They also provide sick animals with water and feed. Both men and women participate in harvesting and transporting feed, chaffing of fodder, feeding of animals, milking, cleaning of sheds and sale of milk. In a study to assess the livelihoods of fisher and agropastoral households in Upper Egypt, Curtis et al. (2014) reported that women's activities accounted for between 20 and 60 percent approximately of household income, lower in regions with off-farm employment opportunities than those without.

### *Role and place of youth*

In pastoral communities, children undertake most of the routine work such as herding and protecting

animals against predators and driving animals to markets. However, there is evidence that youth are increasingly challenging the norms and traditions of pastoral communities by migrating to urban areas to seek social and economic independence, away from their family and tribal units. Leaving the pastoralist way of life means that their access to adult status no longer involves only livestock farming and the transfer of livestock-related rights. For the youth, the challenge of migration relates to the need for room for maneuver, with a view to acquire autonomy outside their household's herd; nonetheless, contributing to securing the family economy remains a condition, for them, for being recognised as adults. The migratory youth therefore represent a bridge between burgeoning urban sprawls and slums and the nomadic and adventurous wandering, and it quintessentially illustrates the evolution of pastoral lifestyles into sedentary urban materialistic domains (FAO, 2020).

### *Assessment of available research on pastoralism*

Most of the publications on pastoralism in Egypt focused on generating archeological evidence on the existence and evolution of pastoralism in ancient times (Keenan, 1989; McDonald, 1998; Brass, 2015; Gellenara, 2018), perhaps reflecting spillover effects from the fascinating archeological research on pharaohs and pyramids that is emblematic of Egypt. There is a dearth of published research on the current state of pastoralism specifically focused on Egypt, however there are wider studies in which examples to illustrate specific phenomena and arguments are drawn from Egypt e.g., (African Union, 2010). The only study found specifically referring to pastoralism in Egypt was that by Curtis et al., (2014), which characterised the food and security and livelihood situation of fisher and agropastoralists from Upper Egypt and made recommendations that future projects may take on board to ameliorate their current precarious food security and livelihood status.

### *Public policy in support of pastoralism*

In our review of Egypt's agricultural and livestock production policies, we have not found policies or

part of policies that support pastoralism. There is currently no specific legislation, strategy and action plan specifically concerned with sustainable management of the rangeland at national, governorate or local government levels in Egypt, but “there are different articles of national legislations and regulations that deal directly with livestock, animals, feed, veterinary animal health and welfare, land ownership as well as agriculture”. Most of the rangeland-use practices are subject to customary law (URFعرف). The URF customary laws are designed to regulate individual behaviors within and among groups and communities, including specification of penalties and punishments for violators (Rizk and Saifelnasr, 2020) on management and utilisation of resources in rangelands, but these have yet to be codified and incorporated into local and national laws and regulations.

The Egyptian Constitution (2014) contains some articles focusing on the conservation of biological diversity and natural resources in Egypt; Article (29) calls for the protection of agricultural lands from infringement.; Article (32) Preserving the natural resources of the State and making good use thereof, and taking into account the rights of the next generations; Article (44) Protection and sustainable use of the river Nile and Groundwater; Article (46) for a healthy environment and the rational use of natural resources to achieve sustainable development. The National Strategy for Sustainable Development (NSSD) is currently being updated in Egypt to take into account the environment and biodiversity protection and sustainability obligations to which it is committed as a signatory of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), Convention on Biological Diversity, Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation to the Convention on Biological Diversity, United Nations Convention to Combat Desertification, United Nations Framework Convention on Climate Change, Sustainable Development Goals, and The Aichi Biodiversity Targets. To this end, 20 national targets for the NSSD have been set (Rizk and Saifelnasr, 2020) and various laws and regulations, including ministerial decrees are being revised,

crafted, and rolled out to meet the country’s obligations with regards to Multilateral Environmental Agreements (MEAs), listed above, to which it is a signatory, including those that support the rangeland ecology and protection from degradation and loss of biodiversity.

### *Pastoralism and rangeland management*

The accessible or consumable dry matter for grazing herbivores in rangelands hugging the Mediterranean coast in northern Egypt was reported to be about 741 kg ha<sup>-1</sup> year<sup>-1</sup> in the non-saline depressions, 371 kg ha<sup>-1</sup> year<sup>-1</sup> on the ridges, and 745 kg ha<sup>-1</sup> year<sup>-1</sup> on the inland plateau: giving an average of 677 kg ha<sup>-1</sup> year<sup>-1</sup>, equivalent to about 4.5 kg ha<sup>-1</sup> yr<sup>-1</sup> per mm of rainfall (Heneidy, 2012). Annual average of the primary production in the western desert was 590 ± 117 kg ha<sup>-1</sup> year<sup>-1</sup>, while the accessible production was 410 ± 39 kg ha<sup>-1</sup> year<sup>-1</sup>, compared with that of the woody steeps in arid zones which ranges from 300 to 600 kg ha<sup>-1</sup> year<sup>-1</sup> (Le Houérou, 1972). Because of aridity, consumable rangeland species in Egypt are dominated by browse shrub and tree species in contrast to rangelands in wetter areas of sub-Saharan Africa which are dominated by annual and perennial grasses (Heneidy, 2012). Beyond the areas of barren land which compose 94% of the country, Egypt has 4 to 10 million of hectares rangelands within the semi-arid to hyper-arid range. Those areas sustain limited biodiversity compared to other areas, but it is high in terms of actual and potential ecosystem services. Most of the entire rangeland area is covered with sparse vegetation; in 60% of the rangeland area, vegetation cover does not exceed 4% of total surface cover. The healthiest rangelands can be observed in the north part of the country. When the definition of rangelands is stretched to include rainfed croplands where integrated crop-livestock systems dominate, the area under rangelands can be considered approach 15 million hectares.

There is agreement that rangelands have deteriorated substantially in Egypt with respect to productivity, biodiversity, and resilience to various stressors. The negative effects of human activities such as overgrazing, deforestation, erosion, land degradation, desertification, arid land use conversion to agriculture and tourism, and urban

encroachment have exerted pressure on rangelands are now in a poor condition. These factors have resulted in an almost complete removal of vegetation cover, a speeding up of the desertification process and the destruction of wildlife habitats in rangelands. Increasing levels of aridity because of climate change also contribute to the loss of vegetation cover, productivity, and biodiversity in rangelands in Egypt (Heneidy, 2012; Rizk and Saifelnasr, 2020). Increasing human and livestock populations in Egypt are also increasing the rate of rangeland degradation, and livestock production is increasingly becoming dependent on heavy use of feed concentrates, cereal grains, and agricultural by-products.

Ministry of Agriculture and Land Reclamation is responsible for the monitoring and management rangelands in Egypt. The research and technical support to the MALR in this regard is provided by the department of Environmental and Range - Division of Environment and Arid Land Agriculture of the Desert Research Centre. Research and extension services on fodder and rangeland research is housed in the Field Crop Research Institute (FCRI) – Agricultural Research Centre (ARC) of MALR, which has several fodder research teams working at various research stations in the country, and the Bourg El Arab Animal Research Station and Camel Research Station. The Ministry of Environment is also involved in research and extension activities to conserve biodiversity throughout Egypt. Several universities are also involved in rangeland management and conservation research and extension activities, including Cairo, Ain Shams, Alexandria, Matrouh, Zagazig, Al-Azhar and Suez Canal universities (Rizk and Saifelnasr, 2020). The authors lament that there is currently no policy or government body (legislative and institutional framework) to coordinate the activities of various actors in rangeland ecology and management to reduce the rampant deterioration of this important resource in Egypt.

### *Climate change and pastoralism*

Egypt is one of the hottest countries in the world, and extreme climate events are becoming more frequent, which is consistent with the warming of the planet. The impact of this warming on

ecosystems is severe, including on livestock production systems and rangelands whose productivity and biodiversity will be reduced by increasing frequency and severity of droughts. Smallholder integrated crop livestock systems constitute the largest component of the livestock production systems and products in Egypt, and high temperatures and droughts will reduce the availability of feed and crop residues on which this system is anchored. Under Egyptian conditions, livestock already suffer heat stress periods in summer and increased temperatures will increase the incidence and severity of disease and parasitic infections increasing livestock morbidity and mortality. The predicted temperature increases due to climate change will affect livestock production by reducing growth and milk production because of appetite suppression and conception rate reductions and will increase animal welfare concerns. In severe cases, these effects can result in death. A reduction in animal production by 25% over the course of this century because of global climate change is anticipated in Egypt (Goma and Phillips, 2021). With respect to pastoralism, increased aridity and reduced availability of water and grazing resources, will have a negative impact on the productivity and welfare of rangeland animals, food, and income security of pastoralists, threatening their nomadic lifestyles, and is likely to increase their propensity to revert to sedentary lifestyles.

In general pastoralists are keenly aware of changes in climate that have been occurring over the past millennium and are highly adept at adapting to changes in the ecology, productivity and biodiversity of rangelands that occur because of climate change and other shocks, as this is part of their culture which allows them to survive and thrive, in difficult semi-arid and arid environments. Destocking to reduce livestock numbers to match reduced carrying capacity, increasing the range and distance of movement in search of water and pastures, diversifying livelihood options including planting crops and increasing other livelihood activities such as trade, changing diets from reliance exclusively on animal products to include cereals other plant products, allowing some of their children to migrate to urban areas, and becoming sedentary are some of the

coping strategies to climate change reported by pastoralists (Kitasho et al., 2020).

As discussed earlier, Egypt is beginning to grapple with putting into place a comprehensive legal and policy framework on rangeland management. In this regard, proposed legislation of sustainable rangeland management to address sustainable management of rangelands, integrate rangeland resources into protected areas legislation, establish customary law council to protect the rights of communities and pastoral community's indigenous knowledge, protect indigenous property rights (IPRs) over wild and cultivated material of rangeland, regulate access to grazing resources (GRs), and provide incentives to herders to maintain biodiversity, environmental system and promote production, all under the auspices of a proposed National Rangeland Committee (NRLC), has been drafted (Rizk and Saifelnasr, 2020).

#### *International and regional cooperation in support of pastoralism*

The development of the legal and policy framework for sustainable rangeland management in Egypt is being financed and facilitated by United Nations Environmental Program (UNEP) project titled “Healthy Ecosystems for Rangeland Development (HERD): sustainable rangeland management strategies and practices” under the Global Environmental Fund (GEF ID: 9407). IUCN-ROWA: International Union for Conservation of Nature and Natural Resources, Regional Office for West Asia is the project execution partner. In Egypt, the Desert Research Centre received US \$ 6,527,000 implement the two-year project. The objective of the project was to strengthen restoration and sustainable management of pastoral rangelands for the provision of ecosystem services and protection of biodiversity in Egypt and Jordan and catalysing scale up regionally and globally.

## 4. CONCLUSIONS AND RECOMMENDATIONS

### *Conclusions*

Integrated crop–livestock systems are a form of sustainable intensification of agriculture that relies on synergistic relationships between plant and animal system elements to bolster critical agroecosystem processes, with potential impacts on resilience to climate change. In Egypt, small-scale agriculture and pastoralism are tied together because most SSFs practice integrated crop–livestock production. They also ensure rich and diversified diets, especially when they include small ruminants, poultry, fruits and vegetables that can readily be available to household, when needed for the preparation of balanced and nutritious meals. Since SSFs mixed farms merge into semi-arid and arid environments where pastoralists operate, the development of strong relations and mutually reinforcing activities amongst livestock keepers (including pastoralists and agro-pastoralists) and SSFS can also lead to improved relationships among these two groups as well as to a more efficient and effective natural resource management including the facilitation of nutrient recycling and improved system diversity. Despite the use of subsidised inputs for sustainable intensification of crop production in Egypt, food, and nutrition security of SSF households is being threatened by increased levels of fragmentation of plots because of social and religious norms of inheritance and increased population pressure on land and water resources, as result of the “youth bulge” in the population structure of the country. For nomadic and transhumance pastoralists, their livelihoods, customs, and traditions are increasingly under pressure from agricultural and urban development encroachment into arid and semi-arid environments, rangeland deterioration and desertification, largely because of overgrazing and climate change. Compared to men, poor access to land and resources for production, food, nutrition and income security for women and youth still loom largely unresolved in Egypt. Based on these conclusions, the following recommendations are proposed.

## *Recommendations*

- Use a holistic food system approach encompassing the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption, and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal, and natural environments in which they are embedded, in designing policy and project interventions for the integrated crop-livestock system for SSFs in Egypt.
- Pivot training of agricultural practitioners, scientists and extension personnel towards sustainable agriculture, agroecology and food system approaches to provide manpower to the country that is invested in sustainable intensification of smallholder farming systems in Egypt
- Mainstream gender and youth equality to integrate gender and youth perspectives into the preparation, design, implementation, monitoring and evaluation of all policies, regulatory measures, and projects in Egypt.
- Subject the newly developed sustainable rangeland management policy to widespread and extensive participatory reviews by stakeholders, including smallholder farmers, nomadic and transhumance pastoralists, traditional leaders, and custodians of indigenous knowledge, before it is submitted to parliament for final debate and codification.
- Accelerate the land ownership registrations for SSFs and large-scale commercial farmers to stimulate investment and increase productivity.
- Seek a national consensus on how the nation may manage fragmentation of land parcels at the disposal of households and mainstream agreed action points into policies and programs of government and other non-state development actors



## REFERENCES

- Aboulnaga, A., I. Siddik, W. Megahed, E. Salah, S. Ahmed, R. Nageeb, D. Yassin, and M. Abdelzaher. 2017.** Study on small-scale family farming in the Near East and North Africa region. Focus country: Egypt. Cairo. FAO, CIRAD, CIHEAM-IAMM <https://www.fao.org/3/i6497e/i6497e.pdf>
- African Union, 2010.** POLICY FRAMEWORK FOR PASTORALISM IN AFRICA: Securing, Protecting and Improving the Lives, Livelihoods and Rights of Pastoralist Communities. Addis Ababa, Ethiopia.
- Baker, Raymond William, Hopwood, Derek, Goldschmidt, Arthur Eduard, Little, Donald P., Smith, Charles Gordon and Holt, Peter M. 2022.** “Egypt”. *Encyclopedia Britannica*, 18 Aug. 2022
- Behnke, R., M.E. Fernandez-Gimenez, M. Turner, and F. Stammler. 2011.** Pastoral migration: Mobile systems of livestock husbandry. In: E.J. Milner-Gulland, J. Fryxell, and A. R. E. Sinclair (ed.) *Animal migration—A synthesis*. Oxford Univ. Press, Oxford. p. 144–171.
- Brass M. 2015.** Interactions and Pastoralism Along the Southern and Southeastern Frontiers of the Meroitic State, Sudan. *Journal of World Prehistory* 28(4): 255-288. doi: 10.1007/s10963-015-9089-1. Epub 2015 Nov 28. PMID: 27158190; PMCID: PMC4856204
- Curtis, L., Omondi, I. Khalifa H., Salem, A. 2014.** Food security and livelihoods assessment of fisher and agro-pastoralist households in Upper Egypt. Food and Agriculture Organization of the United Nations. FAO Regional Office for the Near East and North Africa. Cairo.
- Dina Najjar, Bipasha Baruah & Aman El Garhi (2020):** Gender and Asset Ownership in the Old and New Lands of Egypt, *Feminist Economics*, DOI: 10.1080/13545701.2020.1743877
- El-Enbavy, H., Ecker, O., Figueroa, J. L., Leroy, J. L., & Breisinger, C. (2019).** Characteristics of smallholder farm households in Upper Egypt: Implications for nutrition-sensitive agricultural interventions (Vol. 20). International Food Policy Research Institute
- El-Hefnawi, Ayman Ibrahim. 2005.** ‘Protecting agricultural land from urbanisation or managing’ the conflict between informal urban growth while meeting the demands of the communities (Lessons learnt from the Egyptian policy reforms). A paper prepared for the 2005 World Bank Urban Research Symposium, Brasilia, Brazil, 4-6 April 2005.
- Fahim N.H., Abdel-Salam S., Mekkawy W., Ismael A., Abou-Bakr S., El Sayed M., Ibrahim M.A.M., 2018.** Delta and Upper Egypt buffalo farming systems: a survey comparison. *Egyptian Journal of Animal Production* 55(2): 95-106
- FAO, 2020.** Final summary Pastoralist youth in towns and cities Supporting the economic and social integration of pastoralist youth Chad and Burkina Faso. <https://www.fao.org/3/ca7216en/CA7216EN.pdf>
- FAO. 2010.** Land and Gender Database-Egypt. <http://www.fao.org/gender/landrights/report/?country=EG>
- FAO. 2016.** AQUASTAT Country Profile – Egypt. Food and Agriculture Organization of the United Nations (FAO). Rome, Italy.
- FAO. 2022.** Gender, water, and agriculture – Assessing the nexus in Egypt Cairo. <https://doi.org/10.4060/cc0452en>
- FAOSTAT, 2011.** Food and Agriculture Organization of the United Nations, Statistics Division. Dataset
- FAOSTAT, 2016.** Food and Agriculture Organization of the United Nations, Statistics Division. Dataset. [http://faostat3.fao.org/faostat-gateway/go/to/download/Q/\\*/\\*E](http://faostat3.fao.org/faostat-gateway/go/to/download/Q/*/*E)
- FAO 2000.** FAO’s information system on water and agriculture: Egypt. <http://www.fao.org/nr/water/aquastat/countries/egypt/index.stm>

Freedom House. 2009. Egypt. [www.freedomhouse.org/template.cfm?page=172](http://www.freedomhouse.org/template.cfm?page=172)

**Gallenara M. 2018.** Mobility and pastoralism in the Egyptian Western Desert in the Holocene regional settlement patterns. *Arid Zone Archeology* 7 (2018) Monographs.

**Goma, A.A.; Phillips, C.J.C. 2021.** The Impact of Anthropogenic Climate Change on Egyptian Livestock Production. *Animals* 2021, 11, 3127. <https://doi.org/10.3390/ani1111312>

**Government of Egypt. 2009.** Ministry of Communications and Information Technology. 'ICT for government: Corporeal agricultural land registry's automation project.' <http://www.mcit.gov.eg/ProjectDetails.aspx?id=uRTMQY0HCWA=&type=ICT%20for%20Government>

**Heneidy S. 2012.** Rangelands in arid ecosystem. [https://www.researchgate.net/publication/284410586\\_Rangelands\\_in\\_arid\\_ecosystem](https://www.researchgate.net/publication/284410586_Rangelands_in_arid_ecosystem)

**International Fund for Agricultural Research. 2010.** US\$ 48 million IFAD support to Egyptian farmers for improved water management related to climate change. <http://www.ifad.org/media/press/2010/14.htm>

**Kassem, H.S, Bello, A.R.S., Alotaibi, B. M., Aldosri F. O., Straquadine, G. S. 2019.** Climate Change Adaptation in the Delta Nile Region of Egypt: Implications for Agricultural Extension. *Sustainability* 2019, 11, 685; doi:10.3390/su11030685

**Keenan, J. G. 1989.** "Pastoralism in Roman Egypt" *Bulletin of the American Society of Papyrologists* 26: 175-200.

**Kitasho, N., Abdallah, J. M., Zakayo, R. 2020.** Adaptive capacity to climate change of pastoralists in Kilosa district, Tanzania. *Tanzania Journal of Forestry and Nature Conservation* 89 (1): 25-46

**Krätli S., Huelsebusch C., Brooks S., Kaufmann B. 2013.** Pastoralism: A critical asset for food security under global climate

change, *Animal Frontiers* 3(1): 42–50, <https://doi.org/10.2527/af.2013-0007>

**Land Center for Human Rights. 2004.** Women, land and violence in rural Egypt. Land and Farmer Series, Paper #29

**Le Houéou, H. N. 1972.** Continental aspects of shrubs distribution, utilisation and potentials: Africa- The Mediterranean region. In: *Wildland Shrubs, their Biology and Utilisation* (McKell, C. M. Blaisde Blaisdell, J.P. and Goodin, J. P. eds.). USDA, US for sero. Gen. Tech. Repo. INT.01: Ogden, Utah

**Leach, K.; Zalat, S.; Gilbert, F. 2013.** Egypt's protected area network under future climate change. *Biological Conservation* 159: 490–500.

**Madbouly, Mostafa K. 2005.** Egypt Case Study. Report presented at Drylands Development Center Stakeholder Workshop on Equitable Access to Land and Water Resources, 28–30 November, Beirut. [arabstates.undp.org/contents/file/EGYPT.doc](http://arabstates.undp.org/contents/file/EGYPT.doc)

**McDonald, M. M.A. 1998.** Early African Pastoralism: View from Dakhleh Oasis (South Central Egypt). *Journal of Anthropological Archaeology* 17 (2): 124-142. <https://doi.org/10.1006/jaar.1998.0320>.

**Ministry of Agriculture and Land Reclamation 2020.** Building Resilient Food Security Systems to Benefit the Southern Egypt Region- Phase 2. PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

**Nazir, Sameena and Leigh Tomppert. 2005.** Women's Land Rights in the Middle East and North Africa: Citizenship and Justice.

**Rabley, Peter. 2008.** Egypt's parcel-based deeds registry spurring on the mortgage market. GIM International. [http://en.landsystems.com/downloads/GIM\\_Dec08\\_Rabley.pdf](http://en.landsystems.com/downloads/GIM_Dec08_Rabley.pdf)

**Rizk, R and Saifelnasr, E. (2020).** Policies and interventions related to sustainable rangeland management & land degradation neutrality in Egypt. Egypt. Arab Organization for Agriculture Development

**Taylor, Noel. 2005.** Cadastral survey and mapping issues report. USAID Egypt Financial Services Project.  
[http://pdf.usaid.gov/pdf\\_docs/PNADG846.pdf](http://pdf.usaid.gov/pdf_docs/PNADG846.pdf)

**United Nations-Habitat 2007.** Global Reports on Human Settlements 2007: Enhancing Urban Safety and Security. <http://www.unhabitat.org/content.asp?typeid=19&catid=555&cid=5359>

**United States Agency for International Development. 2004.** Strategic Plan Update for Fiscal Years 2000–2009.  
[http://pdf.usaid.gov/pdf\\_docs/PDACA516.pdf](http://pdf.usaid.gov/pdf_docs/PDACA516.pdf)

**United States Agency for International Development. 2010a.** USAID/Egypt web page.  
<http://egypt.usaid.gov/Default.aspx?pageid=9>

**United States Agency for International Development. 2010b.** A Historical Look.  
<http://egypt.usaid.gov/Default.aspx?pageid=6>

**United States Office of Inspector General. 2009.** Audit of USAID./Egypt's Financial Services Project. Audit Report No. 6- 263-10-002-P.  
<http://www.usaid.gov/oig/public/fy10rpts/6-263-10-002-p.pdf>

**USAID. 2001.** Knowledge, attitudes and practices of Egyptian farmers towards water resources. National Survey 2001. United States Agency for International Development

**World Bank. 2008.** Doing Business 2009: Country Profile for Egypt. Report No. 45837. Washington DC: World Bank.

**Ziadeh, Farhat J. 1978.** Law of property in Egypt: Real rights. *The American Journal of Comparative Law*, 26 (2):239–271