Iraq Salinity Project **Technical Report 9**

Agricultural Policies and Institutions in Iraq- A Historical Perspective

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Summary

This report presents the most important agricultural policies implemented in Iraq from 1940 up to date. It is based on a survey conducted by local and international researches has been undertaken to study the interventions of the Iraqi Government. It depicts a complex history of the agricultural policies, where governments have always been concerned about food security, agricultural growth, large-scale agricultural investments, maintenance of agricultural infrastructure, and the functionality of food chains and input markets. Overall, the state control for central procurement and delivery of both input and output chains has prioritized instruments such as input subsidies, price controls, state distribution systems, and others. Various Iraqi governments have this approach from 1950 and up todate.

The survey shows that the successive governments have expressed concerns about the inefficient use of water resources and salinization issues in light of the population growth. Over the past 50 years subsidy policies to control production and commodity prices were a priority in Iraq in the last fifty years. Trade policies, however, had a limited scope, as the different governments considered self-sufficiency in food production as a prime objective. Thus, they introduced water and land reclamation policies to manage and control water use to overcome salinization.

The 1991 and 2003 wars have disrupted the effective delivery of agricultural policies leaving no clear estimation on how can policies impact agriculture which accounts approximately 25 per cent of employment in Iraq. Thus, the agricultural sector will continue to be important for the country's development.

A future vision for institutional setting consists of modifying tribal and state economic settings (such as state companies or cooperatives), so providing more leading role to the private sector in the production of inputs, including machinery and services, credit and finance, and assistance to the rural sector in the planning agricultural lands, and facilitation of commodity market chains.

1- Policies of land desalination and reclamation

Iraqi governments started as early as 1932 to place an emphasis on building and operating large dams, reservoirs and irrigation projects. Particularly the Dujailah and Ishaqi projects were successful to increase irrigated areas, but with no considerations in regards to soil salinization (Arar, 1961). In the 1950s, studies on salinity started in the country (Arar, 1961; Buring, 1960). One of the first experimental stations was set in Dujailah area, where Dutch experts initiated research programs on the impact of salt on the productivity several crops, as well as leaching effects, water consumption of plants in the presence of salinity, distance and depths of field drains (Burns, N., 1951). In this area (Dujailah) the government stated in 1951 the construction of a main water system pipe, 15 km length, with other secondary branches benefiting large fields in Dujailah region (Boumans, 1954). Subsequently, in the 1960s and early 1970s the construction of water irrigation systems with public funds slowed significantly. In the 1980s the Ministry of Irrigation embarked into a number of projects for building small irrigation systems, which were administrated by farmers who committed to maintain and administrate the systems.

In 1974 the government established the State Organization for Soils and Land Reclamation (SOSLR) as a special division for studying the problems of soils in desert areas and rain fed lands (Al-Taie, 1979). An experimental station was established to carry out studies on the management of these soils. The creation of SOSLR was considered an important step towards implementing rehabilitation of salty soils into productive lands. The functions of SOSLR were mainly related to logistical and operational realization of all land reclamation activities. Within the life project of SOSLR (1974 till 1987), it was estimated that this organization fully rehabilitated 2.412 million Donums, equivalent to 6.030 square kilometers (Al-Hakim Abdul Hussein Nuri and Basim Mohammed Abed Ali, 2008).

Once the work of SOSLR was interrupted (officially completed in 1987), the restored areas were neglected and a re-salinization process started mainly due to lack of maintenance of field drains, and poor farmers' association performance in undertaking collective and field drain maintenance tasks. Currently about 8 million Donums (20.000 square kilometers) in middle and southern areas of Iraq need to be reclaimed (Hassan Muhammad Qutaiba, 2001). High reclamation costs (3 million Iraqi Dinar - ID / Donum), lack of financial resources, inexperience of Iraqi firms to carry out the reclamation works and unwillingness of international firms to work in Iraq because of the local security situation constrain the capacity of the Ministry of Water Resources to fully reclaim these areas. In the light of the positive experience left by SOSLR, implementing policies towards the establishment of an institution or a ministry specialized on land reclamation of saline lands seems the way to go. Such institution should be provided with enough financial resources to work not only with domestic firms but also with international firms, so bringing expertise to the country by working on areas related to specialized reclamation work.

2- Water and salinity control policies

2.1 Between 1990s to early 2000

Aiming at providing a better framework for optimal use of available water resources, and in turn increasing planted areas and agricultural yields, a number of water and salinity control-related policies, such the South Al-Jezeerah Irrigation project, were implemented by the Government of Iraq prior to 2003. These policies have been jointly implemented by government bodies as well as by stakeholders, namely, the Ministry of Irrigation, responsible for implementing water policies, maintenance of main and secondary water canals, drains and land reclamation; the Ministry of Agriculture, responsible for field planning; and farmer associations, responsible for maintenance of delivery water canals. Research work carried on policies in agriculture policies in Iraq (Al-Hakim Abdul Hussein Nuri, 2005a; Al-Hakim Abdul Hussein Nuri, 2002) identified the following issues associated to design and implementation of water policies in the country before 2003:

a. Lack of large investments to build up new irrigation networks;

b. Shortage of funding to maintain existing irrigation networks;

c. Lack of incentives to implement widespread use of modern irrigation technologies (e.g. sprinkler, drop and under surface irrigation);

d. Insufficient application of supplementary irrigation in rain-fed areas. Major supplemental irrigation projects (such the South Al-Jezeerah Irrigation project irrigated 200.000 ha) were discontinued in their implementation due to the 1990 sanctions;
e. Lack of rationalization in the use of groundwater (stockpiling renewed), resulting in overexploitation of groundwater. Traditional methods for well pumping in semi-desert, desert edges and desert regions have not been used widely;
f. Lack of effective technical assistance to build small reservoirs (or tanks) in the desert valleys with the purpose of water harvesting. Yet, in the late 1990s and early 2000 many projects, mainly in the form of field experiments and demonstrations, have been undertaken for water harvesting;
g. Poor enforcement of existing regulations to comply with river water use, construction of dams for irrigation purposes, generation of electricity, etc;
h. Weak in-situ training and extension on storing water in such a way of using reservoirs in periods of excess water to employ it in the periods of water scarcity;
i. Weak institutions to enforce exiting water taxation policies. In 1995 the Iraqi government introduced a law (No. 12/1995) to annually tax water use based on land size and type of irrigation systems. The water taxation system did not work properly, and few water revenues have been collected. Yet, the Government used to claim that revenues collected were used maintaining irrigation systems and drainage (e.g. cleaning of irrigation and drainage networks);
j. Although good engagement with international cooperation for implementation of irrigation projects, few projects have successfully been implemented in order to reduce land salinization in the country.

2.2 Current Situation

After the 2003 war, all administrative and political bodies of the new Coalition Provisional Authority governing Iraq experienced substantial changes in structure, duties, accountability and obligations. Government authority was transfer to an Iraqi Interim Government until June 2004, and then a permanent government was elected in October 2005.

With the new government, the previous 2003 Ministry of Irrigation became the Ministry of Water Resources, which from 2005 onwards undertook several revisions of past water policies, to analyze the changes needed to control salinity and to improve irrigation schemes throughout the country (Al-Hakim Abdul Hussein Nuri, 2005a). In general, government's policies aimed at improving food production through increased productivity (higher rates of yield) aiming that depending less on international markets, and rather achieving self-sufficiency. To achieve such higher production, the following water policy measures were implemented (Al-Hakim Abdul Hussein Nuri, 2005b):

- Promoting water user associations. The purpose has been to significantly reduce or eliminate traditional wasting water practices (such flood irrigation), so decreasing water losses, as well as applying equity criteria in the use of water resources;

- Implementing water extension programs, aiming at better management in water transport and storage. A specific objective has been reducing illegal water flows to the Gulf countries;
- Investing in new water-pipe networks for improved irrigation and salinity control, aiming at rationalizing water consumption;
- Coordinating water policies with neighboring countries, particularly for the Euphrates and Tigris rivers (Al-Hakim Abdul Hussein Nuri, 2006). Water resources have been diminishing in Iraq, and therefore the government through the Ministry of Water Resources has been seeking strategic alliances with upstream countries such Iran, Turkey and Syria, to design a rational framework to make efficient use of shared water resources. In fact, the water policy has been regarded by the government as one element pertaining to a package of agricultural and non-agricultural regional policies that are of common interest for neighboring countries (Al-Hakim Abdul Hussein Nuri, 2006);
- Investing on improved farm irrigation systems, such sprinkler and drop irrigation (led mainly by the Ministry of Agriculture), aiming at a more efficient use of water resources;
- Promoting Iraqi nationals to study abroad on areas related to water management. The new government signed cooperation agreements with Australian, American and Egyptian universities to grant preferences to Iraqi graduates to pursue advanced studies in agricultural disciplines. Benefited graduates were committed to come back to the country and work for the various branches of the Ministry of Agriculture and the Ministry of Water Resources.

Yet, according to our literature survey, there are no revisions that have been made in order to evaluate if these water policy measures achieved their expected results.

3- Input subsidy policies

3.1 Between early 1990s to early 2000

The Public Distribution System, developed in the 1990s as a response to the international sanctions that foul imports of agricultural commodities into Iraq, consisted of heavy subsidization of basic food staple aiming at preventing humanitarian crises in the country. However, at the same time it removed incentives for private producers to react to market signals in the form of increased domestic agricultural production (FAO, 2010). Prior to 2003, production subsidies were applied to strategic crops throughout the country. These subsidies affected wheat, barley, paddy, maize, sorghum, cotton, sunflower and sugarcane. The criteria for selecting such crops to benefit from subsidies were the importance of those for domestic food security, ability of farmers to cover production costs (the lower the farmer's cost recovery, the higher the subsidy farmers received), and the contribution of these crops to the GDP (Al-Hakim Abdul Hussein Nuri, 2005b). The work to estimate the subsidy was quite meticulous. E.g. in the case of wheat, the Ministry of Agriculture basically used to take into account all production costs - such cost of inputs, mechanical works, man power, administration – and divided this amount by average yield so estimating production costs per metric ton of wheat. To this average cost, transport costs per MT and marginal profit of 25-50% of total costs minus marketing costs were

calculated to evaluate the amount of the subsidy so keeping prices affordable for the domestic population.

When overproduction was realized, the government just purchased it at subsidized price. It used to store and release in seasons of high demand. Farmers had guaranteed prices, but with a high financial burden to the government. Complementary to the production subsidy, the government used to provide direct subsidies to inputs also, so benefiting other agricultural commodities that were eligible to the first subsidy (food security was the main determinant for subsidy eligibility). Input subsidies were provided to fertilizers, pesticides, seeds and agricultural machines. Imported inputs received most of these subsidies. The policy tool used for subsidies consisted of using a double exchange rate policy; i.e. setting a special price for inputs (lower that international markets) and decreasing the exchange rate so less Iraqi currency could buy more dollars used to buy agricultural inputs abroad.

3.2 Current situation

The subsidy scheme in Iraq was severely disrupted after the 2003 war. Attempts to add new input subsidies benefiting oil derivatives, green houses and the date palm were undertaken, but poorly achieved due institutional, political and financial issues that negatively have affected the country since the 2003 war started (Al-Hakim Abdul Hussein Nuri, 2011).

The general approach to estimate production subsides continued with no change until 2009, when the Ministry of Agriculture issued a new way of calculation of subsidies for wheat, barley and paddy. Under this new scheme, farmers in Iraq get a 15-30% subsidy from the resulting value that comes out of computing average international market prices corrected by international transport costs (Secretariat of the Cabinet, 2009). Since 2008, the government started buying premium class dates (Zahdi) from local producers paying a higher than the international price (450 thousand ID/MT vs 150-200 thousand ID/MT). The purpose has been fostering the domestic date agro-industry, and expanding the international market by selling high quality dates at competitive international prices.

Since 2005, to complement input subsidies, the government introduced a credit policy to support the agricultural sector. This policy was addressed to small farmers that borrow small amounts (enough to cover operating costs, such as fertilizers, seeds, pesticides, etc), with a concessional interest rate of 2% per year (Hammadi, 2007). This interest was levied to cover administrative costs of government agencies providing the credit. This credit approach was discontinued in 2008, and replaced by another credit policy, in the same year, that was interest-free. This last credit scheme was an initiative coming from the Prime Minister office, which charges no interest rates to loans that are going to be used for investment in the agricultural sector of Iraq. That is, investments in agricultural production, agricultural equipment, inputs and agricultural services (Ministry of Agriculture, 2011).

Production subsidies used for exporting agricultural commodities are usually banned in the frame of the WTO (“Red Box” agreement). Yet, some of the input subsidies that were discontinued in Iraq were not because of international binding measures, but due to domestic issues, mostly institutional disruption due to the overall adversity situation in the country (Abdelkader, Mohammed Saad, and Mohammed Mohsin Aziz, 2003b). Yet, due to the heavy financial burden that implies the subsidy in the

country, and that agricultural efficiency is a must in international markets if a country wants to remain competitive in the international arena, some requirements for the near future are more deregulated markets, complying to WTO international agreements (i.e. no export subsidies in this case), passing away some subsidies –particularly the most distortive and inefficient ones-, increased productivity and overall implementing fully sustainable production systems that preserve land and water resources. In this line of more efficient subsidies, the government as from 2010 onwards, decided that the people with monthly income higher than 1.5 million ID (about US$ 1250) were discontinued from receiving the food subsidy (known as ration card) from the government.

4- Marketing policies

4.1 Between early 1970s to early 2000

Since 1979 the government, through the General Organization for Agricultural Marketing (GOAM), introduced marketing policies in the country in order to stabilize farm incomes, provide support to agricultural production and to protect consumers by stabilizing agricultural markets (Harbi, 2007). These measures were introduced in parallel with other agricultural policies such the above-mentioned subsidy program on prices and inputs.

Since inception, the GOAM implemented different marketing policies to break through some private monopolist markets, so turning towards more competitive conditions. The more important policies were the establishment of state wholesale markets in overall Iraq, that involved building of farmers markets close to agricultural production areas; establishment of frozen, refrigerated and normal storage facilities; providing public scales for free use of sellers and buyers; suggesting measures for standardization of packaging and equipment; providing regulations for ruminant slaughtering procedures in the country. These marketing policies were supported by credit policies during the period between 1973 and 1979 which benefited producers of vegetable products.

The government in 1972 started with the supervision and control of the grain trade in the country (Law No. 50, 1972; Law No. 85, 1961). The private sector role in grain trade was virtually ceased. The grains produced in the country were by law marketed to the Iraqi Department of Grain Trade. In only one year (1973) this department became the only buyer of grains in Iraq. The date production sector also experienced the same intervention. By early 1970s, the state was the only party in charge of buying high quality dates for international markets (Iraqi Gazette, 1970a; Iraqi Gazette, 1970b). After 1987 the GOAM started to transfer some market functions to the private sector. E.g. the construction of most marketing infrastructure facilities (such as stores, packing and sorting centers), procurement of machinery (trucks) and administration of wholesale markets were transferred to the private sector. Market controls (i.e. price) for vegetables and fruits were liberalized in 1987. Yet control, on behalf of food security, was shortly reintroduced in the period 1989-1995 for many agricultural products (Abdelkader, Mohammed Saad, and Mohammed Mohsin Aziz, 2003b).

The 1991 near-total financial and trade embargo imposed by the United Nations Security Council against the government compelled the authorities to impose restrictions on the selling (export) of grains to international markets. The purpose for such restriction was to ensure enough grain inputs for the Iraqi industry, as well as enough grains for domestic household consumption. These sanctions stayed largely in force until May 2003, and when lifted producers and middlemen were free to sell the grains to wherever more convenient. Thus, agricultural and livestock production have been generally subsidized with levels that have reached 78% of total production cost. When subsidies have been so high, frequently they have included input and output subsidies. Another way of support to the Iraqi private agricultural sector has been in the form of exempting all agricultural commodities from any kind of tax (Abdelkader, Mohammed Saad, and Mohammed Mohsin Aziz, 2003a). These subsidies were applied irrespective the type of markets prevailing in Iraq, as follows:

- Governmental niche that purchased strategic products such wheat, barley, sunflower, rice and paddy rice, cotton, maize and sorghum. As mentioned before, the usual practice for setting the market price consisted of unilaterally government fixing of prices. Government intervention not only limited to agricultural commodity markets but also was extended to control agricultural supply markets. Thus, machines, equipment, irrigation systems, seeds, pesticides, fertilizers, poultry feed, veterinary vaccines and medicaments were all price-controlled by the government.

- The private sector market, where operations for suppliers and consumers were free from government regulations. In Iraq, private markets brokers, wholesalers and retailers had specific roles to fulfill as follows: Wholesale markets (Alawi), include offices brokered the sale of fruits and vegetables from producers to wholesalers, who might include value added to the product (e.g. packing, cleaning) for which they get service commissions, and the spread between wholesaler and retailer price. Wholesalers also have infrastructure facilities store agricultural products, as they are frequently engaged into exporting agricultural products to large international hypermarket chains. Retailers, normally purchase from wholesalers, without introducing any value added input, and sell agricultural products to consumers.

4.2 Current situation

The Ministry of Agriculture identified policies oriented to improve the functioning of agricultural markets (Harbi, 2007). The objective of these policies was to raise the efficiency of commodity markets: a) classification and grading of agricultural commodities; b) adding value and packing of agricultural commodities; c) expansion of agro-industry transformation and processing facilities; d) modernization of cooling and refrigeration storehouses; and e) strengthening of information networks to promote competitiveness.

An indirect policy to foster price stability to consumers was to look after the stability of the national currency. However, the Iraqi Dinar (I.D) has experienced abrupt changes after the Gulf War in 1991. Due to the international sanctions placed on Iraq and the excessive government printing of bank

notes, the I.D devalued rapidly and by late 1995, US$ 1 was about 3.000 I.D. Following the deposition of the government, the Coalition Provisional Authority issued new I.D towards the beginning of 2004. The new banknotes appreciated from 4.000 dinars per U.S. dollar in 2004 to about 1000 dinars per dollar. In the last years up to March 2012, the exchange rate has fluctuated around 1170 dinars per US dollar at the Central Bank of Iraq. Yet, the exchange rate in the black market is around 1200 dinars per US dollar. These fluctuations have clearly prevented from stabilization of domestic commodity prices.

5- Mechanization policies

5.1 From early 1950s to early 2000

In the 1950s, international companies used to trade agricultural machinery and equipment through branch offices in Iraq, which used to trade directly to the farmers, mostly to the big landowners. Post-sell services were frequently offered by international companies. By the end of the Hashemite monarchy in 1958, the new Iraqi Republic prohibited international companies operating through branch offices. Such offices were nationalized, and therefore the machinery and equipment businesses were completely in the hands of the government (Salter, 1955). In the seventies and eighties this situation did not change significantly, with the state in charge of trading agricultural equipment. The distinguishing characteristic in these last two decades was that the state became fully in charge of mechanization services that consisted of government-run machine stations that used to rent tractors and harvesters to the farmers or group of farmers unable to buy such equipment by themselves. In summary, the state was responsible for purchasing, importing and distributing of machines and equipment used in the agricultural sector.

Since 1987 the state farms were progressively discontinued. The selling of agricultural equipment gradually was opened to private sector, while the government still maintained hegemony over importing and selling agricultural machinery. The government kept its role as main importer and seller of agricultural machinery sometimes at subsidized prices. In 1993, a new law for the Ministry of Agriculture was issued, which pointed out that the main activities of the government should be addressed to agricultural research, services and extension.

5.2 Current situation

After the 2003 war, the new government sought to deal with well-known agricultural issues mainly affecting the medium and small producers in Iraq. The new administration identified that such issues were mechanization-related problems as follows (Ministry of Agriculture, 2007b):

a) Relatively small number of agricultural machinery and equipment in relation to the agricultural population;
b) Lack of equipment versatility in terms of horse power;
c) Lack of adaptability to perform different agricultural cultivars;
d) Obsolete agricultural equipment in hands of farmers;

e) Lack of specific machines to conduct particular tasks such as uprooting potatoes, beets or cranes required for servicing the date palms.

Earmarked funds from the government were allocated to initiatives for providing with small machines and irrigation systems to medium and small farmers. The private sector imported and supplied, in coordination with the government's Agricultural Supply Company, the needed equipment to farmers. A report from the Ministry of Agriculture (2007b) recommended that a comprehensive mechanization policy for the sector should include the following measures:

a) To allow again international companies producing agricultural machinery and equipment to open branches in Iraq, offering the products directly to consumers, and providing after-sale services, such full training in the use and maintenance of agricultural equipment;
b) To implement an agricultural credit system for supporting farmers buying small equipment at zero interest rate;
c) To reduce/remove trade regulations interfering with importation of agricultural machinery by the private sector. Such removal would allow importing at reduced prices so providing incentives for more competition among importers;
d) To establish a technical facility to test any imported agricultural machinery and equipment so ensuring quality and compliance with the agricultural needs and characteristics of the various regions and soil types of Iraq;
e) To invest part of the oil revenues in the establishment of agricultural machinery and equipment factories. Such factories should work on obtaining licenses from international well-known companies to domestically produce parts of agricultural machinery at initial phase, aiming later to establish full production lines and complete local assembling of machinery;
f) To encourage the establishment of private companies that provides agricultural machinery services to farmers (such renting of harvesters, seeders, etc);
g) To establish training centers for young people using the concept "learning by doing", specifically applied to modern agricultural machines and irrigation equipment.

6- Agricultural extension policies

In general the agricultural extension has been weak in Iraq. The problems that extension and associated research systems experienced in the country are summarized as follows (Al-Hakim Abdul Hussein Nuri, 2011):

a) Problems facing the agricultural systems production *vis-a-vis* the needs for agricultural extension (the farmer and the farm) have not been effectively addressed;
b) Farm problems in economic, social and cultural dimensions have not been fully addressed by scientific research. Poor pragmatic and holistic approach has been used to identify effective development projects that increase agricultural production, and lead to improved levels of living for the rural population;
c) Transfer of findings and recommendations emerging from research and scientific studies has not always been effective. In fact, lack of effective communication on new techniques and trends on

innovative production systems have not been widely and effectively transmitted to farmers through the different extension programs;

d) Infrastructure facilities for extension services have not been at the level needed to achieve centers of excellence for extension and agricultural development. Lack of fitted equipment necessary to perform the tasks of a modern extension services was frequently inexistent;
e) Training facilities frequently lack appropriate laboratories materials to teach extension officers and students needed technical information for them to be more confident and knowledgeable about good agricultural practices;
f) Preparation of extension guidelines for agricultural technicians in the various disciplines of agricultural and rural development have not always been strong, and thus needs improvement. Particularly, guidelines for training of social workers to manage the social units in the agricultural areas need to be updated and improved;
g) Networks of extension centers have not coordinated fluently, and thus exchange of good practices in extension and materials were not always shared among centers.

In view of these limitations that historically have affected the extension services in Iraq, the new government has considered introducing new extension policies which should improve communication and coordination between agricultural research centers and extension services. The new extension policy envisages to strength the link between researchers and extension officers through the establishment of mechanisms for regular communication (such weekly meetings and multidisciplinary research) to bring researchers and extension workers together to exchange ideas and experiences and to lay the foundations for best joint approaches in the achievement of effective extension (Ministry of Agriculture, 2008). The overall extension policies include:

- To document the current situation of agricultural extension in Iraq in perspective and comparing with extension experiences and success stories in other parts of the world. This involves learning from developed countries' agricultural extension best programs, concepts and methods;
- To improve the communication and implementation of joint activities between domestic and international institutions of agricultural research and agricultural extension centers;
- To implement pragmatic ways to effectively convey results of scientific research in such a way that they are fully applicable and adaptable to local conditions;
- To develop agricultural technologies for the medium and small farm systems, covering all aspects of complex agricultural environment of Iraq;
- To introduce cost-effective incentives to stimulate agricultural producers to adopt proven-effective agricultural technologies (i.e. packages). Such incentives have to take into account socio-economic restrictions farmers might have, as well as their limitations on their "take on board" capacity to absorb new technologies;
- To strength the image and trust on extension officials, for them to be more confident in their everyday interaction with farmers. The social profile of extension officials need to be scaled up as it has been handicapped by many factors including the social and political conflict in the country that have prevented them from performing effectively in the eyes of the agricultural

community. A high profile of extension offices can lead to quicker agricultural development in the country;

- To establish at least two strong post-graduate centers designed to provide high quality training to graduate students from local and international universities. The graduates from these centers should later strength and serve the different Iraqi ministries involved with agricultural development, environment and conservation of natural resources. Such center could have cooperation agreements with universities from Australia, US, Europe, Egypt and others in order to ensure promising Iraqi students be also trained at their universities;
- To establish at least two training and extension centers in each of the provinces of Basra and Najaf (and perhaps a third center in Sulaimaniya), to strength agricultural production in these provinces.

7. Research policies

7.1 From early 1990s to early 2000

Before 2003, the agricultural research policy in Iraq was grounded on the concept that food production was to be improved to achieve food security as a final goal throughout the country. The way to increase production was based on the development of agricultural technology applied to increasing agricultural productivity (i.e. higher rates of yield) aiming at accomplishing self-sufficiency. Therefore, the Ministry of Agriculture focused its efforts in a research policy approach that privileged widespread of national development programs throughout the country, with the understanding that up-to-date agricultural cropping systems was the way to go to start an era of modern Iraqi agriculture. Higher agricultural production would lead to the improvement of farmers' economic and social life in the country. Some points to highlight are as follow:

1. These programs took into consideration the farming systems in Iraq, and studied the problems faced by the agricultural systems in the fields. Multidisciplinary research teams were operating to offer an integrated package of technologies in order to increase the productivity of agricultural systems in targeted areas;

2. Continuing research in agricultural research centers as well as national development programs. The work of research centers became very important for the Ministry of Agriculture, which concentrated on facilitating coordination and cooperation among research institution;

3. Research policies in the agricultural research centers have taken the following trends:
   a. Introduction and development of seeds varieties with high productivity of appropriate environmental conditions for different areas of Iraq;
   b. Development of highly productive strains adapted to the conditions in Iraq;
   c. Intensify researches on farm management;
   d. Intensify research in horticulture.

4. Addition to the above policies, research has focused on:
    a. Making way for researchers and graduates to conduct research and higher studies in various agricultural subjects and topics related to the agricultural production and its utilization in the development of agricultural work;
    b. Working on scientific communication with the outside world, despite the comprehensive embargo on Iraq, by participating in seminars, conferences and workshops, national, regional and global, and follow a variety of ways to get publications, books and modern scientific publications;
    c. Providing the necessary supplies for laboratories to sustain the scientific momentum and keep the continuity of scientific research;
    d. Encourage scientific research through the granting of awards to researchers and give them certificates and titles in addition to the support of their income through allowances, incentives and gifts.

Yet, not all of the envisaged success was achieved, as some issues were difficult to overcome and affected the expected results. These research-related issues were:

- A large number of high-yield varieties were developed in the country (according to Al-Jumaily, Seham and Mohammed Al-Aqeedy (2003), 102 different verities were released during the period 1992-1999), but research centers experienced some difficulties in introducing seeds varieties with high productivity that were fully suitable to the environmental conditions of all different areas of Iraq;
- In spite that a significant amount of research in horticulture took place in Iraq, there were periods of financial and logistical limitations to intensify research in horticultural crops;
- Agricultural research has been of high quality in Iraq, but the Embargo against the country affected its institutions in many ways, being one of them lack of incentives and financial means for researchers and graduates to continue undertaking high quality research and studies in various agricultural subjects needed to develop approaches for agricultural intensification;
- Difficulties to cope with the far-reaching embargo on Iraq that made hard for many Iraqi scientists to fully participate and exchange scientific work with the outside world. This situation affected the participation in seminars, conferences and workshops, as well as in a variety of ways that affected the procurement of publications, books and latest scientific developments;
- Issues with research laboratories that were not always endowed with all lab equipment and materials needed to sustain continued scientific research;
- Difficulties with financial resources and incentives in the form of awards, certificates of achievement, cash prices or other type of motivation, that could have encouraged more scientific research in addition to the support of income particularly of young scientist initiating their research careers. Despite the Embargo, the Ministry of Agriculture still provided some financial aid to continue research programs, while Iraqi researchers got many special awards, particularly from Arab Organization for Agricultural Development.

Thus, the research program in Iraq found some issues with producing agricultural technology as well as with transferring technologies to farmers. With the international community sanction on the country, it became very complex to perform adequate agricultural research, which not only depend on financial resources, but also on a whole system for generation and adoption of technologies by farmers.

7.2 Current situaion

The new government reassessed the entire agricultural research policy situation in the country. Likewise in the past, research policies became very important for the functions of the new Ministry of Agriculture. A fundamental criterion was to continue undertaking research in agricultural research centers as well as through national development programs. The Ministry of Agriculture retained the leadership and supervision of research centers aiming at achieving cooperation and coordination among institution. The new agricultural policy incorporated the following considerations (Ministry of Agriculture, 2011):

- To find overall approaches to deal with complex problems identified during the 1990s and first years of the present decade;
- To undertake specific research in those agricultural crops that have low yields, diseases and are important for food security;
- To undertake research beyond the agronomic field, and using multidisciplinary teams to study problems that farmers are facing with marketing, domestic and international prices, transportation, storage, commodity chain, manufacturing, social dimensions, etc;
- To improve coordination with extension services in such a way that research outputs and recommendations can effectively raise yield rates of many agricultural crops in Iraq;
- To analyze agricultural technologies developed in other countries to adopt them in such as way that such technology is tailored to the needs of Iraqi farmers. That is, high yielding varieties, affordable and compatible with their whole life customs, social setting, traditions and friendly to the environment;
- To develop new technologies to raise the efficiency of production factors and inputs to reach higher levels of productivity. Particularly, salinity is an issue in Iraq, and therefore technologies to deal with soil salinity should be further developed in strong collaboration with farmers;
- To introduce incentives to undertake more quality research;
- To improve facilities required by local and decentralized research stations;
- To improve agricultural and environmental maps of Iraq for better natural resource management;
- The improve research on the use of renewable energies (solar, wind, etc);
- To intensify research on balanced combination use of fertilizers for irrigated and natural rain fed agricultural crops;
- To expand research on the of agricultural residues in the preparation of organic fertilizers and mushroom cultivation;
- To form a special research group on rice agricultural technologies for intensification of paddy rice (for food security purposes);

- To strengthen research on organic agriculture and market niches (for commercial and export earning purposes);
- To engage more research resources in developing hybrids and varieties of seeds for the agro-industry business;
- To research of bio-fertilizers and bio-salinity treatments to overcome land degradation problems;
- To engage more resources into of productivity of farm animals;
- To build banks of genetic resources (taking into account the rich diversity of Iraq).

The research activity will include the following directions: a) Sustaining and develop the resources and utilize them the best utilization possible; b) Using of integrated biological control technologies; and c) Building banks of genetic resources.

8. Conclusion

Iraq is historically an agricultural country with rural tribal relations playing a fundamental role in the dynamics of the sector. Before 1958, the feudalism was the dominant on agricultural production, transformation and trade (Caesar, 1960). The feudal system Sheikh used to manage large lands through servants (AlSerqal) who were in charge of production and handling of production inputs used in farming. The 1958 Agrarian Reform in Iraq meant a revolution in the agricultural sector as the feudal lands were divided among the peasants, and the feudal lords lost, in the light of the Agrarian Reform Law, their total control and leadership on agricultural sector. On the one hand, more social justice was achieved, but on the other hand sudden deterioration on production was observed (Al-Hakim Abdul Hussein Nuri, 2004). More research is needed to analyze the agrarian reforms after 1958 and the consequent agrarian reform acts and laws. The implication of these laws has been profound and long term impact on Iraqi agriculture sector. Despite the positive social dimension of these reforms, the impact on the sector efficiency was evident in terms of productivity and the overall performance of the sector.

After the events of 2003, farmer associations were still functioning, and many attempts were made from the leaders of these associations to obtain state recognition to legitimize them as official institutions. A few of the unions were recognized, and many remain disregarded, but even the associations recognized are not fully taken into account in the design of agricultural policies. In the last years, group of farmers began to re-establish specialized agricultural associations on the basis of commodity production types, and to establish civil society organizations to influence tribal relations through social and civil functions.

Also in the last years, large companies have started to invest in agriculture (production or services) or agro-processing. Yet, the tribal influence remains very much powerful within the countryside and in the cities, affecting the formation of private firms and all community working in the agricultural sector.

The agriculture sector accounts for approximately 25 per cent of all employment in Iraq. Thus, agricultural policies will continue to be a priority. In fact, the National Development Strategy made a

provisional allocation of US$ 4.1 billion for agricultural development over the period 2007-2010 (Ministry of Agriculture, 2011). Unfortunately, due to substantial under-spending within the sector and the exorbitant costs of public sector staffing, investment within the agricultural sector has had little impact on growth and employment. As a result, a revision of effective policies with a new framework approach, such public-private partnership, will have to be considered to reap expected benefits in terms of agricultural growth and employment improvement over the short and medium term.

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