

3. METHODOLOGY USED IN PREPARING THE MONOGRAPHS¹

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For insuring their highest possible degree of quality, objectivity and transparency; for facilitating reading and understanding them; and for allowing a cross-country analysis, all the monographs had to be concise (from about 5 to 6 pages for the small NARSs to about 15 pages for the largest ones), homogenous and balanced, and had to provide some precise basic qualitative and quantitative information/data.

For these reasons, the four institutions which sponsored the study decided that the monographs had to be prepared by national teams made up of small numbers of highly qualified national consultants¹ according to precise guidelines prepared by the scientific editor of the study.

The guidelines specified the expected size and contents of the monographs, and a proposed methodology adapted from similar previous regional studies, especially those conducted by CIHEAM (Istanbul, 1987) and FAO (West and Central African NARSs, 1993), and from many NARS reviews done by CIHEAM, FAO and ISNAR.

The following notes describe the main features of these guidelines. They first present the main contents of the monographs (Section 3.1) then consider the definition of a NARS and the categories of its scientific and technical institutions (Section 3.2). Then a description of the concepts and definitions related to the human and financial resources of the NARS follows, with a brief assessment of the advantages and drawbacks of the method used to calculate these resources (Section 3.3). Section 3.4 is related to the synthesis tables which represent a summary of each monograph.

3.1 CONTENTS OF THE MONOGRAPHS

Each monograph has five sections which present:

- (i) A brief historical background of agricultural research (AR) in the country.
- (ii) The current structural situation of the NARS. This section is the main one of each monograph and includes:
 - a first sub-section which gives an overview of the relative importance of the three large categories of scientific and technical institutions (STIs) making up the NARS (AR institutes, faculties of agricultural sciences, and other institutions: see the definition of these categories below) and of the bodies/organizations responsible for the national scientific and agricultural research policies, when they exist;
 - a second main sub-section which consists of a set of concise descriptions of the NARS STIs, recording (at least for the most important ones) their mandate and organization; their human, physical and financial resources; their AR activities and programs; and their national and international linkages.
- (iii) An analytical overview of the human, physical and financial resources of the NARS, with an estimate of the total number of potential research years (see explanation in Section 3.3 below) and consideration of the academic level of the different STIs; an estimate of the financial resources allocated to AR (national funds, loans, foreign grants, total funds); and the ratios of national funds to agricultural gross domestic product (AGDP) and total funds to AGDP, which are essential for appreciating the relative importance of the efforts allocated to AR in the country.
- (iv) An analytical overview of the AR activities/programs of the NARS, scientific results, relations with development organizations, impact on agricultural development, and national and international linkages.
- (v) A brief statement on the NARS, which stresses its main strengths and weaknesses and its future prospects.

Each monograph is complemented by a synthesis table (with additional tables for the major NARSs), which summarizes the NARS monograph, and a list of the main bibliographic references related to the NARS.

For facilitating their task, the national teams received these guidelines with examples of monographs prepared in previous regional NARS overviews (prepared by FAO and CIHEAM), as well as questionnaires on the AR institutes and faculties of agricultural sciences and a provisional, incomplete list of available bibliographic references compiled by the scientific editor of the study.

¹ There were two or more national consultants per country (according to the size of the NARS), generally chosen by the country in consultation with ICARDA, from among scientific leaders of different important national institutions (for example, one from an AR institute and one from a faculty of agriculture), recognized as such in their country and often having previous experience in writing such paper.

3.2 CONCEPTS/DEFINITIONS RELATED WITH NARS STRUCTURE

In this section, a definition of the public NARS and the categories of the national institutions making up the NARS is presented.

3.2.1 Definition of the Public NARS

In the most accepted definition, a NARS includes all the national public scientific and technical institutions (STIs) which undertake or include AR activities¹ in their mandate; their resources are limited to those mobilized by the AR activities, without considering those allocated to other activities and mandates. In a broader definition, a NARS includes, in addition to the national STIs, the national political and administrative authorities (ministries/bodies) that help to define, fund and monitor the national AR policy.

Although the two definitions are rather close, the broader definition has the advantage of explicitly recording the significance of the governance organizations in the structural analysis of the NARS. In this study, both definitions exclude, as mentioned in Chapter 1, private and international STIs. However, exceptions have been made in the study when private STIs operate under the governance of ministries and with some public support (e.g., the case of some faculties of agricultural sciences in Lebanon) and when international STIs are operated and funded mainly by one country (e.g., the case of some AR institutes in Turkey).

3.2.2 Categories of National Institutions Making up the NARS

The study includes three main categories of public national STIs making up a NARS: the AR institutes, the faculties of agricultural sciences, and the other institutions. The relative importance, number, and size of these institutions will be considered in the cross-country analysis (see Chapter 9) for defining the concepts of “fragmentation or concentration, integration, and typology” of the NARS.

The formal definitions of these three categories of STIs are given below, followed by the problems of certain borderline cases.

Agricultural Research Institutes (ARIs)

This category covers AR “institutes, directorates, departments, services, and units” that have AR as their main mandate, which means that their scientific and technical graduate staff allocates at least 50% of its time to AR activities. Other mandates, carried out to a minor proportion, may cover other activities such as development and service activities (extension work; seed, plant and vaccine production; soil/water/feed analyses; consultancies; studies; etc.), “current” agricultural production (other than that of seed and seedlings), and academic or professional training.

In the West Asia and North Africa (WANA) region, three types of ARIs exist according to their degree of specialization

- Multicommodity and multidisciplinary ARIs, the most numerous ones, with a mandate covering a wide range of AR fields, at least crop and livestock production, and often other spheres (production systems, agricultural socioeconomics, etc.).
- Specialized ARIs, with a mandate confined to one commodity or group of similar commodities (for example, cereals, cotton, horticulture, animal production and health, fisheries, etc.), one scientific discipline or group of disciplines (phytopathology, crop protection, agro-food technology, agricultural economics), or one production or resource factor (soil, irrigation).
- Semi-specialized ARIs: those in an intermediate position, with mandates covering at least one major AR sector and one related sector.

The administrative/juridical status and organization of the ARIs are diverse as indicated below:

- Autonomous ARIs, endowed with a public administrative status, a board of trustees, a well-defined budget, and specific management rules. In the small and medium-size countries, these autonomous ARIs are “simple,” made up of non-autonomous specialized divisions, departments or units (INRAA in Algeria; ARC, ASRC and MBRC in Libya; INRA and INRH in Morocco; ARC, DRC and NIOF in Egypt; ARC and ARRC in Sudan; ARI in Cyprus; SBAR and CWSR in Iraq; NCARTT in Jordan; LARI in Lebanon; AREA in Yemen; etc.). In some countries, generally the largest ones, we find “multi-organizational” ARIs which govern or coordinate several

¹ In this publication, AR activities cover research on food/agricultural commodities (crops, forestry, animal production, inland and marine fisheries) and all scientific disciplines related to these commodities and to natural resources (soil, water), agro-food technology, and human resources (rural socioeconomics).

other institutions (examples: ARC in Egypt, AREEO in Iran, and GDAR and GDRS in Turkey, which govern semi-autonomous ARIs; IRESA in Tunisia which oversees four ARIs and nine agricultural graduate schools).

- Non-autonomous “institutes, divisions, departments or units,” governed by administrative bodies (ministry, ministry department/division), with a low margin of autonomy/flexibility in resource management, such as CNRF and SEEN in Morocco; DARHRD in Eritrea; DASR, DS, DIWU, DCB and CDCB in Syria; ARD in Bahrain; and ARC in the United Arab Emirates.

Faculties of Agricultural Sciences (FASs)

These are university-level institutions (called faculties, colleges or “higher schools,” according to the country) that grant diplomas and degrees in the agricultural and food sector or in veterinary medicine, with courses lasting at least four years. In the WANA region, this category includes:

- In almost all countries, “Multisectorial/multidisciplinary” FASs, with a mandate covering a broad range of agricultural sciences, at least crop and livestock production and some other spheres (natural resources, forestry, agricultural mechanization, rural economics, etc.)¹.
- In the largest countries (Egypt, Iran, Turkey, etc.), other FASs specialize in veterinary medicine, forestry, and agricultural and food industries.

Institutes that confine themselves to training senior agricultural technicians are excluded here, as they generally do not have highly qualified staff able to implement AR activities.

Other Institutions (OIs)

This category includes the other scientific and “technical” institutions that have AR as a second or minor mandate.

The other scientific institutions are institutions of research and/or advanced training which have agricultural sciences merely as a secondary sphere of activity. Some examples found in the WANA region are:

- Multisectorial/multidisciplinary research institutes or centers, with some branches partly or totally specialized in AR-related fields (examples: NRC and NWRC in Egypt; the nuclear energy organizations or research institutes in Egypt, Iran, Iraq, Syria and Turkey, which devote a small part of their resources to research applied to soil, plant improvement and food technology).
- The socioeconomic research institutes, partly involved in rural socioeconomic (Jordan, Sudan).
- Numerous faculties of science, technology, engineering, economics, arts, etc., which have some departments, units and/or a minority of academic staff members specialized in biological and other sciences directly concerned with the rural environment (botany, genetic resources, biological pest control, hydrology/irrigation, food and agricultural technology, agricultural mechanization, rural economics, sociology and geography, etc.).

The other “technical” institutions are permanent or sometimes temporary institutions in which development or development support is their main mandate, but which also have research or research–development units or implement AR activities, even when those activities are not explicitly mentioned in their official mandate. In the WANA region, they consist of sectorial “research–development” institutes or directorates; sectorial or regional development projects (the huge GAP in Turkey, numerous relatively small projects in Yemen); sectorial development directorates, services or projects (remote sensing centers in Lebanon, Libya, Syria; soil directorate and water agencies/directorates in Tunisia; veterinary laboratory in Ethiopia; etc.); or public agro-industrial enterprises (cotton in Syria, tobacco in Iran and Turkey, etc.).

Borderline Cases

The boundaries between the above three categories may be blurred, as the following examples show:

- Despite their confusing official names, some ARIs have been classified in the OI category, as they are more involved in development than in research (e.g., the Algerian agricultural research–development institutes mainly involved in seed production and extension).
- Some ARIs attached to universities, such as WERSC and MSS (University of Jordan, Amman) and MRI (Lattakia University, Syria), have been classified in the ARI category because of their autonomy within the universities and their strong commitment to research.
- Within some scientific OIs, specialized directorates or departments are clearly specialized in AR fields. They have been considered as ARIs when they enjoy a large degree of autonomy (three AR institutes affiliated to the

¹ IAV Hassan II of Morocco is the unique fully “multisectorial/multidisciplinary” FAS of the WANA region as it also covers veterinary medicine and fisheries.

Sudanese NCR, NCMS affiliated to the Lebanese NCSR) or classified in the OI category when they have limited autonomy (example: the agricultural units of the nuclear energy research institutes mentioned above).

- The importance of the mandates of a NARS institution may change over the years: the Tunisian soil and water directorates are considered as OIs as their development activities currently dominate, while their research mandate was more important some years ago.
- Institutions having the same name in different countries may be classified under different categories: the institutes of nutrition and food technology have been considered as ARIs in Iran and as OIs in Tunisia according to the relative importance of their research (numbers of researchers) related with either food or other fields (human nutrition/ medicine).
- Within the category of “other institutions” it is not always easy to distinguish between scientific and technical institutions (CFRDs in Morocco; the remote sensing centers in Lebanon, Libya, Syria).

3.3 CONCEPTS/DEFINITIONS RELATED WITH NARS HUMAN AND FINANCIAL RESOURCES

3.3.1 NARS Human Resources

The monographs focus on graduate scientific and technical staff members¹, those who hold a university or higher degree (PhD; MS; diploma or BS, acquired after at least four years of university study) in agricultural fields. The monographs extensively use the concepts of research years (RYs), potential RYs (pRYs) and actual RYs (aRYs).

Potential Research Years

One pRY is the equivalent of a full-time researcher (for one year). The total pRYs of a NARS are the sum of the estimated AR pRYs of each of its STIs.

For the ARIs, the number of its pRYs was estimated by multiplying the number of its graduate scientific and technical staff members on duty by the average percentage of time they devote to AR (% estimated by the ARI directorates²). In the (few) ARIs fully engaged in AR activities (100% of their time devoted to AR), the number of pRYs is equivalent to the number of researchers³.

Scientists who were on full-time study leave in their country or outside were not included in the pRYs for the year considered in the monographs (examples: Jordan, Libya, etc.).

For the FASs, the number of its pRYs was estimated by multiplying the number of full-time academic staff members by a 25% normative average percentage of time potentially devoted to AR. This flat rate was adopted because, in most of the FASs of the WANA region, this percentage was generally mentioned by their deans as a normative professional commitment for insuring that teaching remains scientifically relevant and suited to national situations.

Although this normative percentage may appear arbitrary, it was the simplest method for evaluating the AR pRYs of the FASs in order to add them to the pRYs of the other categories of NARS institutions. In any case, in most of the WANA countries, it has been observed that the actual commitment of the academic staff members is much lower because of many constraints and limitations (lack of funds for research, lack of time due to the heavy teaching loads, lack of personal financial incentives, etc.).

For the OIs, the number of pRYs was estimated differently depending on the type of institutions concerned. In the case of the scientific OIs, the pRYs were estimated by a procedure similar to that used for the ARIs or FASs, depending on whether they were research or teaching institutes and on the number of scientists (researchers or professors) involved in agricultural sciences. In the technical OIs with specialized AR units, estimates take into account the number of specialized graduate research staff in these units or the total number of graduate research staff and a rough estimate of the percentage of time allocated to AR activities.

¹ The description of the largest NARS institutions generally gives some information (numbers) on and assessment (qualifications) of the support staff, essentially the technicians and staff with low qualifications (clerks, laborers, drivers, etc.).

² Sometimes this percentage was estimated by dividing the number of graduate staff members belonging to AR departments, divisions or units (thus excluding those working in service or production units) by the total number of graduate staff members.

³ In previous similar studies (Sub-Saharan and Mediterranean countries), it was assumed that a researcher specializing fully in AR (1 researcher = 1 pRY) can devote up to 10% or even 20% of his or her time to other activities (development, extension work, studies, advanced teaching, etc.). Practiced on a reduced scale, such activities are natural complements to AR activities and are particularly helpful in improving their orientation and extending awareness of their results. But with this assumption, it would have been difficult in the present study to differentiate between ARIs in which researchers are supposed to devote 70 or 80% of their time to AR activities.

Actual Research Years and Actual Employment Rates of the Scientific Potential

In each monograph, the pRYs were converted into aRYs, based on the estimated actual employment figures of the scientific potential. These aRYs were calculated for each of the main STIs of the NARS taking into account different criteria.

For the ARIs, the main criterion was the available operating and capital costs (OCC)¹ per pRY. Comparing this ratio with the generally accepted average rates of US\$ 25,000–30,000 per pRY per year used in drawing up medium- or long-term national AR plans provides a tentative idea of the actual employment rate; this reference figure means that if an ARI has only US\$ 10,000 per pRY, its aRYs can at best represent only 33 to 40%² of its pRYs³.

For the ARIs where it was not possible to estimate the OCC per RY, and for all other institutions (FASs, OIs, etc.), other criteria were used, such as the actual employment rate directly estimated by the directorates or by some senior staff leaders in the countries, or the material resources available (in an ARI endowed with good material resources, pRYs and aRYs are equal; on the other hand, in ARIs with poor material resources, the aRYs are much less than the pRYs and very roughly estimated accordingly).

The actual employment rate of the scientific potential of the NARS was roughly estimated by dividing the total aRYs by the total pRYs. Despite its approximate nature, this ratio constitutes the most comprehensive yardstick of the degree of “quantitative efficiency” of the NARS.

3.3.2 NARS Financial Resources/Expenditures

The estimated annual AR financial resources of a NARS are the sum of these resources as estimated for each of its STIs. These individual estimates were made by adding together the various categories of AR resources or expenditures (E): national expenditures (NE), loans (LE), and foreign expenditures or subsidies/grants (FE), to obtain the total expenditures (TE). With few exceptions, they were made in local currency and then converted to US dollars. NE and TE were later used for estimating the ratios NE/Agricultural Gross Domestic Product (AGDP) and TE/AGDP, which are the best ratios for assessing the extent of national AR efforts and for proceeding to cross-country comparisons (see Chapter 9).

National AR Expenditures

For the ARIs, the first step was to calculate their total budget, which generally includes public/budgetary allocations from the government and their own resources:

- Public budgetary allocations: In some countries, all these allocations (staff, operating and capital expenditures) are paid to the ARI budget, while others receive only the sums earmarked for operating and capital costs, with permanent staff being paid directly by some government body (the Ministry of Agriculture, the Ministry of Treasury, etc.).
- Their own resources: These are the resources generated by AR contractual activities financed by national public and private organizations (development agencies, farmers’ cooperatives, private agro-food companies, etc.), the sale of copyrights and publications (a small fraction of the resources), production and/or development activities (seed, plant and vaccine production; production resulting from experimental activities; in some cases routine production undertaken for valorizing available land resources), services (soil/water/feed analyses, soil studies, socioeconomic studies, etc.), education (academic training and refresher courses), etc.

The task of calculating the national AR expenditures of a given ARI on the basis of its total budget/expenditures varies depending on its mandate, as shown in the following:

- For an ARI specializing solely in AR and devoting itself essentially to AR activities, and with resources of its own being drawn mainly from these activities (research contracts, sale of agricultural products resulting from experimental activities, etc.), the AR financial resources are equivalent to the total budget.
- For an ARI with mandates other than research, at the beginning of the study, and as for similar previous studies, NE was calculated by applying a coefficient to the total budget reflecting the proportion of AR activities within the overall activities of the ARI, e.g., for an ARI whose graduate scientific and technical staff allocate 70% of their time to AR, NE amounts to 70% of its total budget. However, this mode of calculation certainly underestimates NE, as most of the other activities (production, services, etc.) are less expensive than research activities. Therefore, it was decided to calculate NE by the following formula: $NE = \text{total budget} \times [\omega +$

¹ OCC represents the outlay of an institution except for the “permanent staff” expenditure. It covers the “support costs” of researchers (their direct working resources), the general expenses of the institution, the depreciation of infrastructure and equipment, the hiring of seasonal staff, etc.

² US\$ 10,000 divided by US\$ 30,000 and by US\$ 25,000, respectively.

³ Comparing the OCC per pRY available for a whole NARS and these norms can also provide a very rough idea of the actual employment rate; however, it is generally not easy to evaluate the total OCC of a given NARS.

$0.5(100\% - \omega)$], where ω is the percentage of time devoted to AR by the graduate staff, which means that for an ARI whose graduate staff allocates 70% of its time to AR, NE amounts to 85% (intermediate value between 75 and 100%) of the total budget. The first mode of calculation (% of time allocated to AR multiplied by the total budget) was used only for the few ARIs specialized in veterinary medicine and which are involved in vaccine production (an expensive activity), and in agricultural socioeconomics, for which the other activities consist mainly of studies having costs similar to those of research.

For the FASs and OIs, the method followed for estimating NE was very similar to that used for the ARIs, with some modifications. For an FAS, national AR expenditures (NE) were assumed to be proportionate to the actual percentage of time allocated by the graduate staff to AR activities. Thus, with a percentage of 10 (roughly estimated for many FASs), NE was 10% of the total budget of the FAS. For the scientific OIs, NE was assumed to be proportionate to the ratio of the percentage of graduate staff specialized in AR activities to the total graduate staff. For the other OIs, NE was generally directly calculated by using all the available information on the OI. For the OIs which did not provide their budget data, NE was estimated based on the average costs of the national and expatriate RYs.

Other Financial Expenditures

Expenditures/Resources from Loans (LE) - In the case of loans (granted generally by the World Bank in Jordan, Morocco, Tunisia, Turkey and Yemen), reference was made both to the information found in the annual reports of the ARIs concerned and the annual installments due under the planned loan (taking into account possible delays in such payments), as well as to a simple division of the total amount of the loan by the number of years covered.

Foreign Expenditures/Resources (FE) - This heading covers grants for operating and capital costs (funds earmarked for the budget of the national institution or items directly financed by the donor: donations of plant products, etc.); training and mission expenses, etc.; the free provision of qualified expatriate staff, and sometimes the payment of certain expenses of national staff. The gross sum of such subsidies was calculated by taking into account all available information. In cases where precise information was lacking and also for the provision of expatriate staff, standard costs per expatriate were used, since these are fairly well known for the main aid agencies.

3.3.3 Drawbacks and Advantages of the Method Used in Calculating the NARS Resources

Margins of Error in Calculating the Resources

Due attention was given throughout the study to the calculation of human and financial resources (pRY and aRY; NE, LE, FE, TE) allocated to AR by the NARSs, leading to successive versions of the monographs in attempts to improve the quality and reliability of the data. However, there should be no illusion of complete accuracy of the data. Depending on the institutions and concepts used, the margins of error, in general, are:

- fairly small for ARIs almost fully engaged in AR activities, even those with a relatively wide range of activities, and small for FASs, but greater for OIs;
- smaller for large NARSs, where the levels of resources are generally rather stable, than for small NARSs, which can exhibit relatively large variations in resources over the years;
- smaller for the large institutions (which received greater attention in this study) than for small institutions (for which some figures should be seen as simply indicative);
- smaller in estimating pRYs than aRYs, and NE than LE and FE; globally, those margins of error may reach 10 to 20% for pRYs and for NE and TE, and 20 to 30% (if not more) for aRYs and FE.

Another margin of error may have originated when the calculated financial resources were converted to US dollars, using the official rates for the year of reference (over-evaluated for some countries).

The essential point was to be as consistent as possible in processing the gathered information, particularly by using the same methods of calculation; this was the main task of the scientific editor of the study.

Advantages of the Concepts Used

Despite its conventional approach and approximations, the methodology offers many advantages. Above all, it results in more complete and accurate monographs than those delivered in previous studies related to the WANA region (FAO and ISNAR, 1990), which confined themselves mainly to the human and financial resources of the ARIs (without taking into account the extent of activities other than AR), and without taking into account the FASs and OIs, or without adding/integrating the data related to all categories of institutions.

The methodology also gives a precise idea of the structure of the NARS and the human and financial resources mobilized by the NARS, and proposes some criteria which allow assessing each NARS and comparing between the different ones.

3.4 THE SYNTHESIS TABLE

The synthesis table (with more tables attached for the larger NARSs) is a simple tool for allowing a comprehensive harmonized presentation of the NARS structure and resources, and for the cross-country comparison presented in Chapter 9. Annex 3.1, “How to Read the Monograph Synthesis Tables,” may be useful for understanding them.

Acronyms of the NARS Institutions

Algeria: INRAA: Institut National de la Recherche Agronomique d'Algérie.

Libya: ARC: Agricultural Research Center. ASRC: Animal Studies and Research Center. MBRC: Marine Biology Research Center.

Morocco: CNRF: Centre National de la Recherche Forestière. IAV Hassan II/Rabat: Institut Agronomique et Veterinaire Hassan II. INRA: Institut National de la Recherche Agronomique. INRH: Institut National de Recherche Halieutique. SEEN: Service de l'Expérimentation, des Essais et de la Normalisation.

Tunisia: IRESA: Institution de la Recherche et de l'Enseignement Supérieur Agricoles.

Egypt: ARC: Agricultural Research Center. DRC: Desert Research Center. NIOF: National Institute of Oceanography and Fisheries. NRC: National Research Center. NWRC: National Water Research Center.

Eritrea: DARHRD: Department of Agricultural Research and Human Resource Development.

Ethiopia: EARO: Ethiopian Agricultural Research Organization.

Sudan: ARC: Agricultural Research Corporation. ARRC: Animal Resources Research Corporation. NCR: National Center for Research.

Cyprus: ARI: Agricultural Research Institute.

Iraq: SBAR: State Board for Agricultural Research. CWSR: Center for Water and Soil Research.

Jordan: NCARTT: National Center for Agricultural Research and Technology Transfer. MSS: Marine Sciences Station. WERSC: Water and Environment Research and Study Center.

Lebanon: LARI: Lebanese Agricultural Research Institute. NCSR: National Council for Scientific Research. NCMS: National Center for Marine Sciences.

Syria: CDCB: Central Directorate of Citrus Bureau. DADR: Directorate of Agricultural Scientific Research. DCB: Directorate of Cotton Bureau. DIWU: Directorate of Irrigation and Water Use. DS: Directorate of Soils. MRI: Marine Research Institute.

Iran: MOJC: Ministry of Jihad Construction. MOC: Ministry of Commerce. MOH: Ministry of Health. AREEO: Agricultural Research, Education and Extension Organization.

Turkey: GDAR: General Directorate of Agricultural Research. GDRS: General Directorate of Rural Services. ARI: Agricultural Research Institute.

Bahrain: ARD: Agricultural Research Directorate.

United Arab Emirates: ARC: Agricultural Research Center.

Yemen: AREA: Agricultural Research and Extension Authority.

References

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FAO (Casas J., Beye G., Kassapu S.) - *The National Agricultural Research Systems of West and Central Africa.* - Rome, 1993 (pp. 3–5 and annex 1 “Notes on Methodology,” pp. 97–107).

Annex 3.1 - How to Read the Monograph Synthesis Tables

These notes are based on the synthesis table of the **Moroccan NARS as an example** (for the other countries, see the final remark in this annex).

a: Number: This normally refers to the code used for identifying the categories of the scientific and technical institutions of the NARS, indicating their nature as follows:

- 1: polyvalent or multisectorial ARI;
- 2: specialized ARI;
- 3: FAS, without distinction of its degree of specialization;
- 4 and 5: other NARS institutions (scientific and technical institutions, respectively).

b: Name - Acronym - Head Office - Year Established: The complete names of the STIs, often not given in full in the synthesis table due to the lack of space, are found in the list of acronyms given at the end of each monograph. The head office indicates the city where the directorate of the STI is located. The year is that of the creation of the STI; when two dates are given, the first is that of the creation of the earliest forerunner of the STI; the second, that of the STI under its present name and/or status.

c: Mandate: The abbreviations used correspond to the various mandates of the STI (in order of importance); parentheses indicate a relatively secondary or marginal mandate. For the ARIs and some FASs and OIs, percentages will sometimes be found in parentheses after the abbreviation AR, corresponding to the approximate average time devoted to this activity by the graduate scientific and technical staff of the STI concerned (based on information provided by the STI leaders). The main abbreviations used to indicate the sphere of activities are as follows:

AD	Agricultural Development
AHE	Agricultural Higher Education (graduate studies)
AHME	Agricultural High and Medium Education (including training technicians)
AR	Agricultural Research
HE	Higher Education (graduate studies)
R	Research

AR Fields: The main sectors of AR are given, the following terms or abbreviations being the most frequently used:

All	A majority of AR spheres (with some exceptions, as indicated in the monograph)
Crop prod.	Crop production
Livest. or anim.	Animal production
Rural socioec.	Rural socioeconomics
Various	See monograph

d: Governing Ministry: Acronyms of the ministry or public organization in charge of the STI, the full name being given in the list of acronyms at the end of the monograph.

e, f, g: Graduate Scientific and Technical Staff e: total number of nationals; f: numbers of national PhD and MS holders; g: number of expatriates.

h, i: Potential Research Years: provided by nationals and expatriates.

j, k: Total Budget: generally given only for ARIs and FASs.

l, m, n, o: AR Budget or Expenditures/Resources: NE: national expenditures; FE: foreign grants.

Other Observations:

Numbers in italics: Approximate numbers; ...: Data not available; *: See table footnotes.

Final Remark:

For other countries, the alphabetical letters used in the synthesis table may change according to the specific characteristics of their NARS; for example, in some NARSs, there are no expatriates or foreign financial resources.