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LINKING THE ESTABLISHED SUBSYSTEMS OF ECONOMIC STATISTICS TO PROVIDE A ROUNDED VIEW OF AGRICULTURE

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Summary

Various aggregate and microeconomic accounting systems exist by which OECD countries attempt to assess, from different perspectives and for different purposes, the economic situation of their agriculture. Some areas of accounting are better developed than others. All can be linked at the conceptual level. In practice, in the EU the accounting systems are often fragmented and their results are therefore rarely integrated and easily reconciled. This paper sets out the linkages between the main accounts currently in use in the EU, and considers the advantages that would flow from a better integrated system based on real institutional units.

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1 Introduction – the need for a rounded view of agriculture

1. For economic statistics to provide a rounded view of agriculture implies that they are capable of throwing light on the range of separate but related issues that concern public policy. Over time these issues evolve and the balance between them on the policy agenda alters, reflecting *inter alia*, technological advance, demographic change, political dynamics, and historical happenings. "Relevance" to the current issues is a cardinal virtue of good statistics. To remain relevant, suppliers of official statistics must respond to changes in problems and policy concerns, or run the risk of obsolescence. This requires not only communication with users of statistics but also a management that anticipates requirements and plans how they can be met. In mature statistical systems there is always a danger that the high costs of change will induce inflexibility and that, as a result, the available statistics will not be rounded, in the sense that they fail to match current needs.

2. At the start of the 21st Century statistics on the economic situation of agriculture are required for two distinct sets of purposes (Hill, 2000). The first is to do with agriculture as an economic activity, including measuring the contribution that agricultural production makes to the broader economy (as reflected in National Accounts). For this purpose, statistics are required on *inter alia* the agricultural industry's output in total and in disaggregated form (by type of crop and livestock etc.), the inputs it uses and its value added. These economic entities can be linked together in *activity accounts*.

3. The second purpose of economic statistics is to cast light on the intrinsic problems faced by the (self-employed) people working in the farming industry and thereby inform policy decisions. These include the low incomes that may be found among farm households on farms of particular sizes and types (the *poverty* issue) and variability of incomes from year to year, in large part resulting from unpredictable influences such as weather (the *instability* issue). These issues often concern the distributional characteristics of economic variables such as income (OECD, 1964; OECD, 1995).

4. With the withering away of concern over the adequacy of agricultural production in the wake of the spread of new technology, the incomes of the agricultural community appear to have become the central issue in shaping policy. An overall view of issues of policy concern is given in Figure 1.

5. Though the focus of attention here is agricultural economic statistics, it should not be forgotten that the broadening of agricultural policy into rural policy, seen both in the EU and in some other OECD countries, implies that statistics will be increasingly demanded that relate to the economic activities found in rural areas and undertaken by the households there, many of which will not be involved in agriculture except marginally, or not at all.

Figure 1 Concerns within agricultural policy and information requirements

	Degree of detailed specification of objectives	
Centre of policy concern	**Aggregate**	**Microeconomic**
Production of agricultural commodities and its use of inputs – essentially an economic Problem	* Contribution to national and regional income; output, inputs and value added. * Concern with the rate of factor return and that it does not constitute an inefficient use of national resources * Ability of agriculture to maintain its productive capacity (capital stock) and how this is financed * Stability of commodity markets * Security of supply and trade issues	* Contribution to the aggregate agricultural activity from farms of different types, sizes and regions. * Factor rewards and productivity by farm type, size and region – level and stability. * Residual entrepreneurial income remaining to the owners of factors of production by farm type, size and region. – level and stability * Ability of types and sizes of farm to maintain their capital stock, how this is financed, and the pressure of servicing debt.
Wellbeing of the agricultural community – essentially a social problem	* Concern with the standard of living of the agricultural community and that it is fair, implying when group averages are compared with other occupation groups. By convention, the two main proxies for well-being are current income (disposable) and personal net worths.	* Poverty (low incomes) among agricultural households and its location (farm size, type, region, socio-economic characteristics of farmer and household * Groups feeling most pressure to leave agriculture * The way that low incomes can be combined with high or low wealth

Figure 2 Type of available agricultural economic statistics

	Level of aggregation	
Centre of policy concern	**Aggregate**	**Microeconomic**
Activity of producing agricultural commodities, its use of inputs, and the residual rewards they earn – essentially an economic problem	CURRENT ACCOUNTS * National accounts (NA) * Industry activity accounts (e.g. Economic Accounts for Agriculture (EAA) from Eurostat, MAFF's UK aggregate accounts (very similar methodology). These are satellites of national accounts * Price, labour and land statistics CAPITAL ACCOUNTS AND BALANCE SHEETS * Partial capital accounts. ** Balance sheets for the "industry" (only some national estimates, including UK and USA)*	CURRENT ACCOUNTS * Farm accounts statistics (EU's Farm Accountancy Data Network FADN/RICA; UK Farm Business Survey; USA's ARMS) CAPITAL ACCOUNTS AND BALANCE SHEETS * Partial capital accounts (FADN/RICA and ARMS) * Balance sheets for the "farm business"
Wellbeing of the agricultural community – essentially a social problem	CURRENT ACCOUNTS * Agricultural household sector distribution of income account (IAHS statistics in the EU, *not available for the UK*) *CAPITAL ACCOUNTS AND BALANCE SHEETS* ** Assets (wealth) accounts for this sub-sector. (Not available at EU level; some national estimates eg Norway)*	*CURRENT ACCOUNTS* ** Distributional statistics on agricultural household incomes – not available in EU except in fragmentary form; examples include Norway, Canada, USA* *CAPITAL ACCOUNTS AND BALANCE SHEETS* ** Distibutional statistics on household balance sheets. Few examples (Norway)*

2 Available statistics

6. An outline of the sorts of accounts statistics needed to throw light on the various policy issues set out in Figure 1 is given in Figure 2. The first row relates to the activity of producing agricultural commodities, the second to the households that undertake this production; households are the most important form of institutional unit in agriculture, other forms being the corporation and government. It is possible to draw up aggregate accounts on both bases in a single conceptual framework, national accounts form such a framework (UN, 1993). Micro-level approaches to complement the aggregate accounts are possible. When accounts form parts of an integrated system there are obvious advantages in terms of consistency and complementarity.

7. The focus of attention of this paper is the statistical system in the EU. In practice, largely for historical reasons, the EU's economic statistics on agriculture have not developed from the starting point of a single fully designed and integrated system. Consequently the organisation and management of its different parts is fragmented, and the results from each tend to be considered in isolation. Some parts are developed well, while others are thinly covered or non-existent. In Figure 2 what is currently available at EU level is shown in normal type; what is conceptually possible but not yet developed is shown in *italics*. Some national statistical systems are clearly better integrated than is the EU system; this applies both to EU Member States (e.g. Germany, Netherlands) and some other OECD countries (e.g. Canada and Norway).

8. Figure 2 shows that the EU (and most OECD countries) has given primacy to accounts for the activity strand (Hill, 2000). At both aggregate and microeconomic levels activity accounts are well established, with methodologies and data collection systems going back at least fifty years. In contrast, statistics related to the economic situation of the agricultural community, comprised of agricultural households, are relatively weak. In the EU, accounts for the agricultural households sector (including their disposable income) of Member States based on a harmonised methodology have only appeared regularly since the mid-1990s and are not fully developed (for example, the UK is not yet included, and no figures for the EU as a whole are calculated)(Eurostat, 2000). At microeconomic level there is no working EU system for generating results for agricultural households[1]; what exists at national level is patchy and incomplete, some countries (again, including the UK) having no satisfactory source of basic data. The situation outside the EU is generally better (Blandford, 1996; Hill, 2000).

9. In part as a consequence of this uneven development, in the EU discussion of issues that relate to the economic situation of farm households (the second group above) is often conducted using statistics based on the accounts for the activity of agricultural production (the first group)[2]. Of course, the two strands are conceptually separate. For example, relatively low factor returns in agriculture do not necessarily mean that the personal or disposable incomes of farm households are low; much will depend on the absolute quantities of resources at the disposable of the households (most importantly, farm size) and the opportunities to receive income from other gainful activities from transfers or from property. Furthermore, accounts that only cover agriculture ignore a substantial part of the overall activities of farmers and their families.

10. To sum up, though a fully integrated statistical system is possible, and a theoretical framework for such an approach exists, at least in part, in reality the EU's array of statistics tends not to work in this manner. In such a fragmented statistical system benefit is likely to flow from examining how the various approaches do or could fit together and drawing attention to the complementarity of the various accounts.

3 Basic units in the several types of accounts

11. In considering the ways in which the various accounts relate to each other, it is useful to have in mind the different basic units that are involved (Figure 3). In the EU the aggregate activity accounts of the Economic Accounts for Agriculture (EAA) and the microeconomic ones of the FADN/RICA are based on units that are, to various extents, fictional whereas the accounts of the agricultural households sector are based on real units (an account for agricultural corporations would be similarly based on real units).

3.1 Activity accounts

12. The agricultural "industry" covered by the EAA does not comprise a collection of real businesses. Rather, it is an aggregation of fictitious units (LKAUs) that have a very limited role in distributional statistics. The use of the LKAU also means that, in its series of current accounts, the EAA can only include the *production account* (balancing item Net Value Added) and the *Generation of income account* (balancing item Mixed Income)(see the Annex for a full series set out in National Accounts methodology) [3]. The next in the series (*Entrepreneurial Income account* with its balancing item of *Entrepreneurial Income*) can only be constructed by making assumptions about the relationship between the agricultural LKAU and the household (or corporation) that owns it. These assumptions are increasingly unsafe.

13. Capital balance sheets for the "industry" are not currently part of the EU system though are calculated by some national statistical authorities (including the UK). Strictly, only partial balance sheets are possible. There are problems in separating assets into agricultural and non-agricultural (vehicles being the classic example), but in particular on the liabilities side the isolation of agricultural debts is both practically difficult and theoretically objectionable because of the fungible nature of borrowing.

14. In agricultural accounting at microeconomic level in the EU, use is made of the **agricultural holding or farm business.** While superficially "real", this unit is quite artificial in many circumstances. It does not have its own legal status but has to be carved out from the activities undertaken by real institutional units. The household (or corporation) owning the holding will often be involved in a range of economic activities, possibly within the same set of enterprise (business) accounts[4], and in forming an account for the farm business the agricultural production element has to be separated off from the rest. This is particularly difficult when inputs are used both by the agricultural and non-agricultural activities (energy charges[5]) or where fungibility is an issue (for example, interest charges). In theory the consumption activities of the household should also be excluded (such as interest on loans for the purchase of consumption goods), though in practice this may be difficult and lead to an over-estimate of the inputs used in agricultural production. With balance sheets for agricultural holdings, many of the difficulties experienced at the aggregate level are also encountered. Of course, assets of a non-agricultural nature owned by the household are excluded, as are debts that are deemed to be non-agricultural, though there is a tendency to be more comprehensive in the inclusion of debt than with assets, resulting in asymmetry.

Figure 3 Types of units in EU accounts (actual or proposed)

Account	Basic unit	Comment
National Accounts / Economic Accounts for Agriculture	The agriculture "industry" is comprised of agricultural Local Kind of Activity Units (LKAUs) – fictional units that only produce commodities deemed to be agricultural	In reality, a farm may have both an agricultural LKAU and a LKAU belonging to another industry. Non-agricultural activities of real farms are excluded from the agricultural "industry", except where they are inseparable secondary activities (e.g. farm shops). Assumes that agricultural activities of LKAUs belonging to other industries can be separated off and covered in these accounts
Industry balance sheet (not yet drawn up at EU level, but nationally by some Member States)	"Industry" of agricultural LKAUs, but also includes landownership as part of agriculture.	Covers assets that are deemed to be agricultural; tenanted land included at present. Assumes that the liabilities of households that operate farms can be split into agricultural and other parts – a dubious process.
Farm Accountancy Data Network (FADN/RICA) and Farm Business Survey (FBS)	The Agricultural Holding or Farm Business (the latter if different), concerned with producing agricultural commodities.	Requires the splitting off of (most) non-agricultural activities undertaken by the household/corporation, whether or not they are closely related in behaviour of the basic units. A little less narrow in the definition of agriculture then the aggregate accounts (above).
FADN/FBS balance sheets	The agricultural holding or farm business	Requires the separation of agricultural and non-agricultural assets and liabilities, the latter particularly dubious.
Agricultural Household Sector distribution of income account (IAHS statistics) - balancing item, disposable income	Real institutional units, in the form of the agricultural household (defined in "narrow" way to include only those where farming is the main income source of the head)	Covers all types of income accruing to the household members and compulsory expenditure (e.g. current taxes). Farming is only one of several sources of income. Assumes that the household represents a realistic single unit for income and expenditure purposes Alternative coverage could include households in which any member has income from farming, however minor it might be.
Agricultural household micro income statistics (not yet drawn up at EU level)	As above for the sector	As above for the sector
Agricultural household capital balance sheets (sector or micro)(not yet drawn up at EU level)	Real institutional units – the agricultural household	Covers all assets and liabilities of the household members Definitions of household and coverage of households as in the income accounts above.

15. The creation of an artificial unit in statistics that forms part of a larger (real) whole runs the danger of reducing the ability of analysts to explain how agricultural production responds to economic signals, as important variables that would assist explanation are being excluded. For example, empirical evidence on things like the intensity of land use, margin generated per hectare, viability to economic stress, investment level, spending on environmental protection and so on are all affected by the presence or absence of income from outside the holding. Indeed, it could be expected that the adequate explanation of many phenomena would need information on the overall activities and interests of the economic unit.

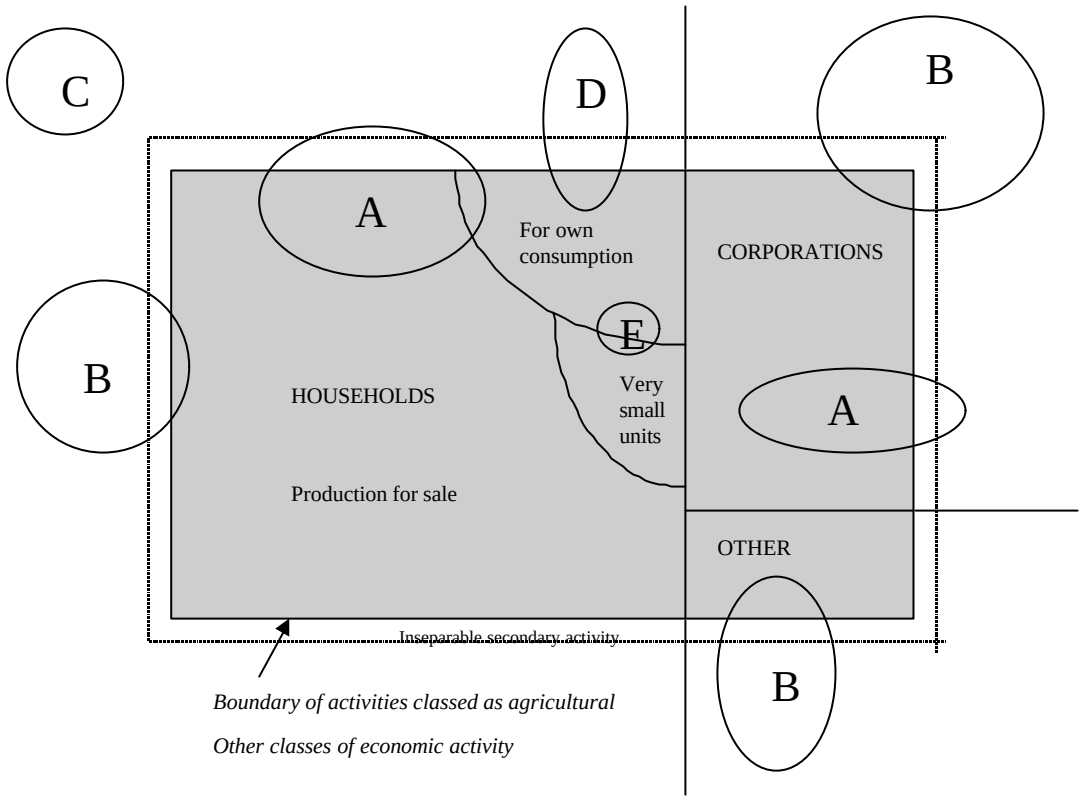
3.2 Household sector accounts

16. Household sector accounts relate to a type of real institutional unit (the household) that has a legal entity. For households, a full series of current accounts can be drawn up that relate to their activities as units of production and consumption. A complete set of capital accounts, including balance sheets, can also be constructed, as they can make contracts and have liabilities. Though accounting systems in OECD countries do not appear to have adopted the approach of series of accounts for agricultural households, it features strongly in the FAO's handbook *A System of Economic Accounts for Food and Agriculture* (SEAFA96) (FAO, 1996).

17. In any attempt to draw up accounts for agricultural households (a plausible perception of what constitutes the agriculture industry), a critical issue is which are to be included. It is unlikely that accounts drawn up for all households that operate an agricultural holding would be very informative.

They would include many for which agricultural production is only a very minor activity. Pragmatically, the EU's Income of the Agricultural Households Sector (IAHS) statistics has adopted two levels of coverage; (a) one based on the main source of income of the household reference person (normally the head of household or largest earner) and (b) a broader coverage including all households where some member receives income from independent activity in agriculture; both A and B would be included in this latter approach. Household D would be excluded if only those producing for sale were to be covered, and Household E would not be included if a minimum size threshold were applied. Information on Household C, with no agricultural activity, might be needed for comparative purposes. Of course, other forms of institutional unit (corporations and others) are not covered in statistics based on households.

Figure 4 Selection of real institutional units



4 Links between accounts

18. The linking element between all the various accounts considered in this paper is clearly the presence of the production of agricultural commodities. Theoretically they can be reconciled by the use of bridges. In a fully developed, integrated system such bridge accounts would be calculated routinely. In reality only a few are encountered. Here the main concern is the broad nature of these links and bridges rather than their precise articulation and enumeration

4.1 The links between the various aggregate accounts of agricultural production

19. As noted above, in many national and multinational accounting systems, the aggregate accounts for agriculture have been activity based, rather than relating to institutional units. This applies both to the special account for agriculture (EAA) drawn up within the EU system that is based in the framework of national accounts, and for measuring agriculture's contribution to the national accounts (for which some adjustment to the EAA approach has been required to make them compatible with other parts of the system). The reason for adopting this activity approach seems to lie mainly in the history of aggregate accounting and the need for timeliness in the method of estimation.

20. The basis of determining the boundary of agricultural activity is an internationally agreed classification system for economic activities (currently in the EU, NACE.Rev1). The position of this

boundary can differ between the national accounts and the EAA, as the conventions of the former are deemed not to result in activities that entirely corresponds to what stakeholders in the agricultural policy process generally envisage as being agriculture. There are also differences between coverage of output coming from units that solely produce for own-consumption that fall below a certain size, and of LKAUs belonging to another "industry" that have agriculture as a secondary activity (an asymmetry of treatment as, of course, non-separable non-agricultural activity is included in the revised EAA).

21. Thus within aggregate accounting for agriculture as a production activity the boundary is not fixed in an absolute sense but is adjustable according to circumstance. The nature of the bridge between the EAA and national accounts is generally well documented and increasingly quantified[6].

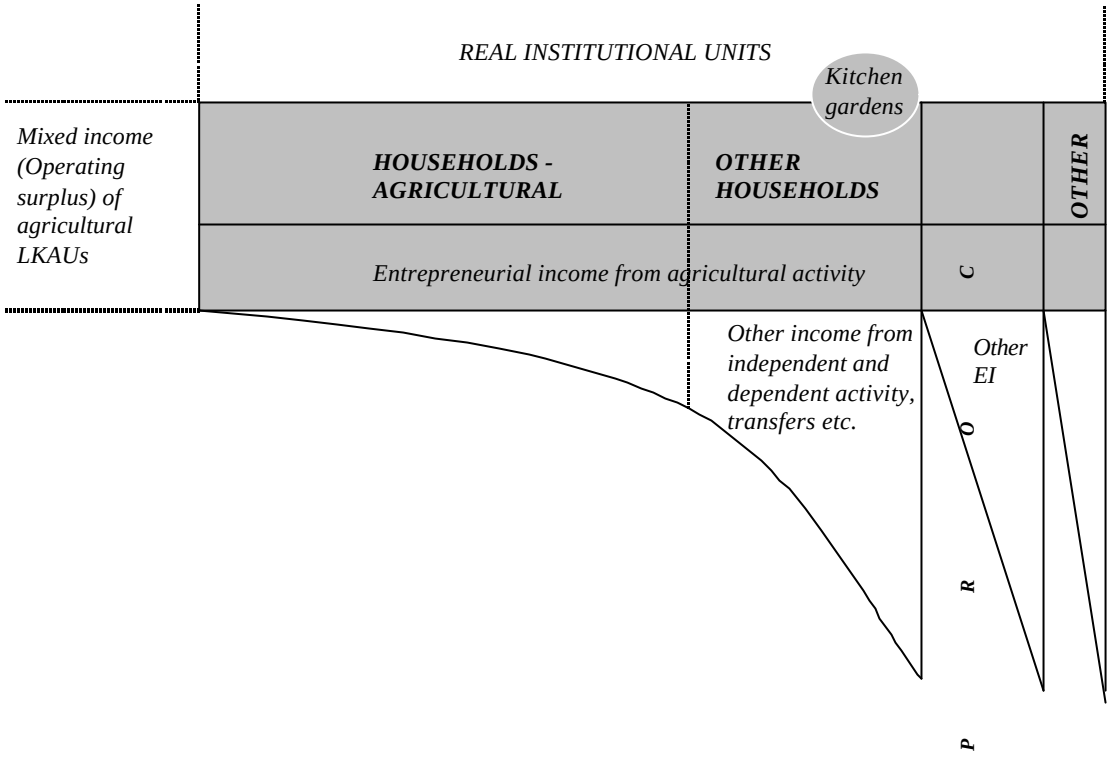
4.2 Links between the accounts for the agricultural households (sub-)sector and the aggregate activity accounts (EAA and agriculture as represented in national accounts)

22. The activity-based EAA (as outlined above) includes the agricultural production of all institutional types (See Figure 5). Household sector accounts (such as Eurostat's IAHS statistics) only cover part of this total, though in practice probably the overwhelming majority in most EU countries.

23. In household sector accounts all the independent activities of households are included in the production account (that is, both their agricultural and non-agricultural activities) and other sources of income are included further down the series. In the EU the IAHS statistics are formed from an amalgamation of the accounts down to the level of the *Secondary distribution of income account*, with its balancing item Net disposable income. At present the account does not extend to the next step, in which disposable income split into its uses for consumption and saving.

24. The main bridge account required to link the agricultural household sector account and the EAA would relate to the coverage of other forms of institution, including household deemed to be non-agricultural. Other less important bridges would also be needed[7].

Figure 5 Relationship between real institutional units and production in agricultural LKAUs



4.3 Links between macro and micro levels in activity accounts ("sector" or "industry" accounts compared with farm accounts surveys)

25. All EU countries have farm accounts surveys but in many they are not a prime source of data for constructing the aggregate economic accounts for agriculture. Consequently the farm accounts results tend to be viewed separately from the aggregate accounts (and the income indicators based on them); they are available later and used for rather different purposes.

26. At EU level little attention has been paid to comparing the pictures painted by grossed up farm survey results and the EAA (one exception being (Hill and Brookes, 1993) where, within a general impression of broadly similar findings, there are examples of quite contrasting patterns). There are two main sources of disparity for which bridges are required to form links. The first relates to the sample and its coverage. In the EU the FADN/RICA aims to be representative of commercial production (though its field of observation does not encompass all forms of production) and, with that in mind, orientates itself to larger units. Thus while the coverage of output is of a high level (82% in 1993) only about half of holdings (and approximately the same share of households operating holdings) are covered. Furthermore, the changing nature of the sample can by itself cause movements from year to year; occasional reweightings (with coefficients taken from the Farm Structure Survey) can produce quite large revisions in results.

27. The second source of disparity is in the way in which individual items are recorded and presented. Though no official item-by-item comparison seems to be available, a cursory examination suggests that large numbers of elements act as sources of variance. For example, in the EU system there may be differences from the EAA approach in terms of:

- timing (not all accounts relate to calendar years starting on 1 January),
- the exclusion of non-agricultural activities (though the revisions to the EAA have narrowed the macro-micro gap)
- valuation
- the treatment of subsidies on capital (included in the FADN/RICA but not in the EAA)
- the precise definition detailed items, so that similar concepts are not necessarily identical in FADN/RICA and the EAA (for example, Family Farm Income and Entrepreneurial Income)
- the systems used to measure the labour units employed in constructing income indicators.

4.4 Links between macro and micro levels in households sector accounts

28. Accounts for the complete agricultural households sector in EU countries fall into two types

(a) those that are part of the system of national accounts and where the accounts of agricultural households are formed (mainly) by disaggregating the results for the entire households sector (such as IAHS results for France, Italy, Spain, Germany).
(b) those that are built up from microeconomic data (such as IAHS results for the Scandinavian countries and Austria)

29. For the first approach, though results for the agricultural households sub-sector results are based firmly within the national accounting framework, there are likely to be disparities with microeconomic results (for example, from household surveys, farm accounts surveys or tax records) because of the differing structures of the accounts leading to disposable income. For example, resource flows to households from independent activity is presented as Operating Surplus/Mixed Income rather than as income after the payment of rent and interest charges. Some items appear in the aggregate account (especially the *Secondary distribution of income account* – see the Annex) that would be considered in microeconomic studies as payments from disposable income rather than as items in its calculation (transfers to NPISH such as churches, mutual societies, charitable institutions and interest on consumer loans). Such macro-micro disparities present a familiar problem to statisticians (Ruggles and Ruggles, 1986). In the present context the differences should not be overstated; for example, Ireland reported that in 1987 they represented about 15 per cent of the total resources of households (Hill, 1995). Nevertheless the conceptual disparity has caused some countries to develop macroeconomic accounts that use balancing income concepts that are closer to those used in microeconomic studies, with bridges to the main accounts[8].

30. For the second group of countries, there is little danger of a macro-micro disparity with the agricultural household sub-sector, though results will be sensitive to the issue of household coverage (such as where all household that operate a farm are included, or only those for whom farming is the main income source). However, there is likely to be non-comparability with the household sector accounts in national accounts, for reasons already given.

4.5 Links between microeconomic accounts

31. Several data sources may exist that contain information about institutional units involved in agricultural production. While in the EU there is harmonisation among international networks of farm accounts surveys and household budget surveys (though the latter are of limited use for studying incomes in an agricultural context (Hill, 2000), reconciliation between disparate data sources in the same country is more problematic (taxation surveys, farm accounts surveys, family budget surveys etc.). As yet there is no internationally recognised standard of microeconomic methodology of the same stature as the SNA/ESA, though proposals have been made (Puurenen, 1990; UN, 1977).

32. Bridging existing data sources involves examining their coverages, definitions and procedures, more a matter of tedium than of conceptual challenge. Where reconciliation is possible, the value of bringing them together is greatly boosted if there is some common identifier by which data relating to single cases can be linked (such as a personal identity number); Canada, Norway, Denmark, Sweden and Finland are examples of this.

4.6 Links between current and capital accounts

33. The economic status of the agricultural community is affected not only by its income but also by its net wealth. In particular, there is concern that policies for support to incomes in agriculture often become capitalised into enhanced land values. In the long term real capital gains constitute a form of personal income which is not captured by current accounts as conventionally drawn up.

34. In the SNA93/ESA95 the sequence of accumulation accounts for households consists of the capital account, financial account, other changes in assets accounts (subdivided into accounts for changes in volume of assets, revaluation and nominal and real gains/losses). Balance sheets take the form of opening balance sheet, closing balance sheet, and changes in balance sheet – with its balancing item *Changes in total net worth.*

35. In EU's aggregate agricultural accounting the convention is not to attempt the whole series of accumulation accounts and balance sheets. Rather, only elements of the capital account are assembled, the link between the current accounts mentioned above coming primarily through (a) that part of output deemed to be capital formation (own-account produced breeding stock etc.) (b) consumption of fixed capital (that accounts for the difference between gross and net Value Added). Balance sheets are not constructed at EU level though several Member States (and other OECD countries) do so at industry level.

36. As noted above, full balance sheets can only be constructed for real institutional units. Nevertheless, as noted above, some countries purport to do it for the "industry" of LKAUs, and farm business surveys (including FADN/RICA) attempt it for the "holding" or "farm business" a dubious practice at either level. Balance sheets for agricultural households, covering all their liabilities and assets are not commonly encountered. However, they have been calculated (though with some problems on the valuation of land) for many years in Norway, based on farm surveys (Hegrenes, personal communication).

5 Discussion

37. In this article's attempt to take a rounded view of agriculture, three main problems have been encountered

5.1 Unevenness of statistical development

38. The first is the apparent mismatch in the EU's system between the statistical requirements of policy and the provision of statistics. In particular, aggregate activity accounts are well developed, but accounts that relate to the activities of agricultural households are far less advanced. Progress is being made in sector statistics for agricultural households (Eurostat's IAHS statistics, developed in the framework of national accounts) but at microeconomic level the lacuna is profound. In contrast some non-EU countries (notably the USA, Canada and Norway) have much more highly detailed statistics at the micro level, but have not adopted the national accounts route.

5.2 Linkages between accounts

39. The second concerns the lack of integration between many of the subsystems of the EU's fragmented economic statistics. In trying to provide a rounded and consistent view of agriculture, some reconciliation between them is needed by means of linkages. Two sorts of link have been encountered. The first concerns the linkages that already exist between individual accounts that share a common formal framework. Establishing a bridge requires an awareness of the system as a set of inter-related parts but does not otherwise present much difficulty. Examples include the link between National Accounts and its EAA satellite for which a formal bridge account has already been set up, and between Production account for LKAUs and the Generation of income account for agricultural households (though this has not apparently been done).

40. The second sort concerns links between various real accounts that, though capable of being organised in an integrated way, for historical reasons have developed independently and which therefore exhibit methodological disparities. Fragmentation of administration is often a handicap in linking their results by means of bridges. Examples include the approaches to measurement of agricultural production contained in the aggregate EAA and microeconomic FADN/RICA, or between the national accounts view of household sector statistics and the microeconomic approach.

41. One approach to improving compatibility of accounts is to collect detailed information on the methodologies of each (definitions and procedures etc.) and thereby identify the nature of bridge tables[9]. Though reconciliation may be conceptually and technically feasible, the costs of quantifying the linkage may not be thought worthwhile in terms of the additional benefits that might flow in terms improved answers to policy questions (other than perhaps on an occasional basis). An alternative approach, often used by international institutions, is to agree with participants a common methodology for the supply of data on which the disparate systems converge over time, making bridges eventually unnecessary.

5.3 Assumed linkages built into existing statistics

42. A third problem to developing a rounded view of agriculture, and one that is particularly intractable, concerns the *assumed* relationships that are built into existing statistical systems to enable them to cope with data inadequacies or resource shortages. Several instances of assumptions have been given above, though a prime example is the way in which the EU's EAA are dependent on assumptions about the holding/household/LKAU identity when calculating Entrepreneurial income.

43. The assumptions present a problem in that they introduce distortions into the picture as described by statistics and can thereby lead to inappropriate policy decisions. An example is the way in which aggregate income indicators, based on agricultural activity accounts for fictitious units, have been habitually interpreted as if they were showing what was happening to the personal incomes of households that engage in this activity (real institutional units). Any inferences drawn from factor-rewards for the welfare of farmers and their families have depended on assumptions about the structure of agriculture that have become increasingly unrealistic. This particular problem of misuse has been identified since at least the 1930s (Peterson, 1933).

5.4 The challenge to managers of the statistical system

44. Statisticians appear to face a challenge of combating misinterpretation, with users failing to appreciate the difference between statistics that relate to activity accounts and those based on real institutional units. A first step might be to restrict activity accounts to the purposes for which they are best suited. This would imply limiting the EAA to the *production account* and the calculation of NVA[10]. Many of the assumptions in the present array of statistics beyond this level would then become unnecessary. There would be a role for microeconomic NVA calculations within farm accounts surveys, though the allocation of variable inputs between agricultural and other forms of production would remain a problem. *Entrepreneurial income* and its microeconomic equivalent would not be calculated.

45. The second step would be to develop a full set of accounts based on households, as real institutional units, to run alongside the activity accounts. This applies both to aggregate accounting and to microeconomic survey-based statistics[11]. This is a prime feature of the FAO's 1996 *System of Economic Accounts for Food and Agriculture* (SEAFA96). The use of the household as the basic unit has the following advantages:

- It permits a complete and consistent series of accounts to be calculated, covering activities of households as producers, their rewards from employment, from property and other sources. The series extends (in theory) beyond disposable income to the estimation of spending on consumption and on savings.
- Artificial partitioning of inputs between agricultural and non-agricultural activities (in the calculation of *Entrepreneurial income*) are avoided.
- Capital accounts and balance sheets could be developed.
- The generation of a range of indicators appropriate to monitoring policy. In addition to production-related indicators (which could be supplemented from those from accounts of corporations and other institutional forms), in the households sector the disposable income indicators are highly relevant in the context of the "standard of living" aim of agricultural policy.
- Easier interpretation, in that non-specialists can be expected to grasp more readily statistics for the industry that relate to a collection of firms which are (largely) engaged in agricultural production, rather than to a collection of fictional units (LKAUs)..
- Improved compatibility and complementarity between aggregate and microeconomic statistics, as they are based on the same household unit.
- In dealing with the essential aspects of the "income problem" in agriculture (instability, low incomes, poor comparability), the microeconomic unit is the one that is of relevance to these issues.

- There is a greater ability to explain aspects of agriculture that depend on the whole institutional unit. This would include farm viability, intensity in the use of land, level of income generated from agricultural holdings, investment levels in fixed capital etc..

46. The definition of the coverage of household units that form part of these accounts is, of course, highly important. Neither must the practical problems of drawing up accounts on this basis be underestimated. Though substantial progress has been made in the EU through the development of the IAHS statistics, at present they do not contain details about the households' resources flowing from independent activity in agriculture (values of output, intermediate consumption, value added, rewards to fixed factors – in short, all the elements leading to *Eutrepreneurial income* in the EAA). In particular, data collection from surveys of farms would need to take a broader approach than is current in the FADN/RICA, though again progress is being made in that direction.

47. However, the existence of better accounts based on agricultural households, at both aggregate sector and microeconomic levels, and suitably complemented by accounts for other real institutional units, would provide a more rounded picture of agriculture. In an integrated system, many of the linkages between activity and institutional accounts would be easier to handle. The outcome would be a set of statistics that arguably comes closer to answering many of the fundamental policy questions that face agriculture at the start of the 21st century.

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ENDNOTES

[1] EU-wide systems that study households (such as the European Community Household Panel and the network of household budget surveys) either throw up too few agricultural cases to be useful (northern Member States) or suffer from poor data quality on incomes (southern Member States).

[2] All the main indicators currently in use in the EU only cover rewards from the production of agricultural commodities. This not only applies fo the aggregate measures (the EU's NVA and – by deducting the payments to fixed factors not owned by the farm households - Entrepreneurial Income) but also the farm-level measures (the EU's Farm Net Value Added and Family Farm Income).

[3] SNA93, para 5.26 "The only data which can meaningfully be compiled for an establishment *(LKAU)* relate to is production activities. They include the following: (a) the items included in the production account and the generation of income account (b) statistics of numbers of employees, types of employee and hours worked (c) estimates of the stock of capital and land used (d) estimates of changes in inventories and gross fixed capital formation undertaken.

[4] No attempt is made here to define what constitutes a single business, though common characteristics might be a single accounting system and a single capital base.

[5] A similar problem concerns the treatment of housing services provided to tenants in property previously occupied by farm workers but no longer deemed to be part of the farm.

[6] See, for example, the annexes in the EAA97 Manual that shows how the old and new EAA can be reconciled, and how the treatment of agriculture under the EAA97 differs from the national accounts approach given in the ESA95. Also a reconciliation is possible between the concept of agriculture under the ESA95 and the strict interpretation under SNA93, though the differences are not so well documented.

[7] As the household sector accounts referred to in this section are (strictly) within the framework of national accounts, a further bridge to the EAA would be needed.

[8] The Netherlands has a system of Socio-Economic Accounts which differs from the households sector account, but can be reconciled with it by a bridge account. In the UK the construction of an Income and Expenditure of Households Account from 1981 onwards (distinct from the personal sector account) was intended to reflect general perceptions of the nature of disposable income by households (CSO, 1985). The only negative items were taxes on income, National Insurance contributions (excluding employers' contributions) and contributions of employees to occupational pension schemes; on the income side, imputed rent was not included on the grounds that it does not normally feature in households' perception of their income.

[9] This approach is also appropriate for assembling international sets of statistics by the OECD. such coping with the differing aggregate accounting conventions found in the US and EU (which nevertheless share a common conceptual base and contain many similarities).

[10] It is uncertain whether the deduction of the costs of hired labour in the *generation of income account* to leave mixed income in LKAUs operated by households results in an entity that is of much value in a policy context.

[11] If needed, parallel sets of accounts could be drawn up for other types of institutional units.