International livestock development and animal recording systems. Some experiences from the World Bank

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Summary

International lending institutions such as the World Bank are supporting public sector investment in food safety and consumer protection. Tracing of animals and animal products is generally considered part of such programs. However, tracing systems are expensive and countries should try to consider the benefits and costs before initiating a national tracing/identification program, and make sure that such investments are backed by a sound livestock strategy and by an assessment of their effect on the poor. Developing countries tend to mimic the system in Europe or north America without giving sufficient thought to the difference in Government support and in livestock systems. Most developing countries and ex-Soviet countries have a large number of small-holders, and the transaction costs of reaching this dispersed livestock population, including a timely recording of changes, are very high and not affordable.

A review of projects and proposals to the World Bank show that the proposed programs are not always fully discussed in a national forum on priorities for the agricultural/livestock sector, and are not well thought through in terms of technical design (especially with respect to movement recording), financial sustainability, and responsible agency.

Sound planning and careful monitoring the costs and impact should be an essential part of these programs.

Keywords*: Animal identification, food safety, livestock economics, benefit-cost analysis, cost recovery, World Bank, poverty, monitoring.*

[1]The opinions expressed in this paper are those of the author and not necessarily of the World Bank and its affiliates. The useful comments from Cornelis de Haan are gratefully acknowledged.

Introduction

In view of the many challenges of international development, bridging the increasing gap between rich and poor, animal recording seems a minor issue. On the other hand it is widely believed that improved international trade may be an important factor in achieving a more equitable development that includes currently underdeveloped nations. Better coherence between trading partners and better guarantees (in transaction, in quality etc.), are expected to facilitate international trade in general and especially in agricultural and animal products where standardization of product quality and safety has been difficult.

Recent food scares such as those caused by bovine spongiform encephalopathy (BSE), and the western European foot and mouth disease (FMD) outbreak have further revived the interest in food safety. In particular there is increased interest in being able to trace farm products from "farm to fork". Over the past few years, tracing systems used to identify animals, monitor their movements, and trace animal products have evolved considerably, largely due to the requirement by large trading blocks (the EU in particular) to have all animals registered. Some of the World Bank borrowers have requested public sector support to establish or improve an animal recording system in their country and some pilot efforts were indeed financed in some countries in the Mediterranean region, Balkans and South America.

Currently, this standardization is driven by large trading blocks (EU, US, Japan), and developing countries need to be vigilant and aware of these new rules in international trade. They should also be aware that these harmonized standards are not always to their advantage, as they are expensive, require considerable administrative sophistication and may take a long time before full (internationally accepted) implementation. A number of studies have described methods and technologies used throughout the world at each stage in the food production chain, or their diversity. This presentation is not doing so, but presents a number of issues, examples and experiences that may guide policy makers in developing countries that are contemplating the adoption of individual animal registration systems.

The World Bank

Before discussing the topic of this meeting, it may be useful to explain a little about the World Bank and its role in development, as there appear many misconceptions about its role and mission. The World Bank is a development institute owned by countries that are its shareholders[2]. The interests of these shareholders are represented by a permanent board of directors and by regular ("annual") meetings. The World Bank's loans and other major interventions are approved by this executive board. The

[2]Extensive information about the World Bank, its mission and lending is available on its external web site http://worldbank.com

Box 1. The lending cycle

In general the World Bank assistance to borrowers begins with a jointly developed and agreed country assistance strategy (CAS). In many countries this may be complemented by a poverty and reduction (and growth) strategy, but the CAS more or less sets out the expected development of a member country, including constraints and opportunities. The CAS also identifies possible World Bank (and donor) assistance often over a medium term timeframe. This assistance program may consist of economic and other analytical work[1] as well as lending.

Lending

A lending program or other activity that is entered in the CAS and still requested by the Government will then need further planning and development. This planning part of the "lifecycle" of a Bank lending program, which is explained on the World Bank's Web site, may take between 1 to 4 years depending on the Government's capacity and the complexity of the proposed operation. The development of lending proposals is the responsibility of the borrowing Government. In cases where the capacity of such Governments is low, it can call upon outside assistance. Especially the Japanese and selected European governments have been generous in providing, untied, financial support to World Bank borrowers for project development. Once a project has been designed a World Bank team will evaluate ("appraise") the design and together with the Government come to a final product that is presented to the World Bank's Board of Directors.

day to day decision making is increasingly decentralized and made in the regional offices, and the Bank has offices in most of capitals of its borrower countries

The resources of the World Bank and its affiliates are generally obtained in the world's financial markets i.e. issuing bonds. The one exception is the International Development Association (IDA) which receives funding from richer countries to be lent out to very poor countries on concessional terms (currently the cut-off point qualifying for IDA is an per capita GDP of US$ 885). The Bank only lends to its members (i.e. governments) except for the International Finance Company (IFC) that also lends to - or

participates with equity in - private entities. With a few exceptions the Bank does not provide grants, and its lending is scrutinized for social, economic and environmental sustainability.

The current overall objective of the Bank's program is to reduce poverty. It does so by providing policy advice, lending and assisting governments to improve access to foreign investment.

Considerations in lending and appraisal

The World Bank only lends to governments i.e. the public sector. It is fully aware, however, that most economic development derives from private sector initiatives. As such it pays considerable attention to assure that its investments are improving the public sector function without discouraging private sector initiatives. The overall considerations in appraising a program or project include (i) its contribution to poverty reduction and development in general, (ii) its economic justification, (iii) a justification as a public sector investment, and (iv) whether it poses any unacceptable fiduciary or corporate risk either to the borrower or to the Bank[2].

In most developing countries the resources available to the government are insufficient to provide comprehensive quality services. In Africa this has been clear for sometime (Anteneh, 1984), in the FSU the issue is just emerging. As such, choices have to be made, and the Bank is sometimes seen as too inflexible about priority and sustainability needs of its investments.

On the other hand producers, under severe budget constraints of governments and developing agencies, are looking for other ways to ascertain delivery of services, and are sometimes surprised to find the alternatives, for example through private sector delivery, may not only feasible but even work better.

Livestock development

World Bank lending for livestock development has undergone a major change during the last decade. The overall trend is to move away from projects and investments that can be carried out by the private sector, and concentrate on removing impediments to private sector development and on those programs that support improved efficiency of the public sector. Consequently, earlier programs that financed state- or parastatal owned large-scale livestock production and processing (whether feed manufacturing or abattoirs) have largely been abandoned[3]. Animal breeding is among the activities considered as a private sector activity

[3]Such investments are now mainly supported through the IFC, or indirectly through non-targeted credit.

that is outside the direct realm of the state and consequently of financing by lending institutions such as the World Bank. Also, the previous trend of free standing livestock projects is changing towards livestock development components that are part of larger agricultural, rural or environmental or credit project. For example the current portfolio of the Eastern Europe Central Asia Region of the World Bank counts one free-standing livestock project, but at least a dozen projects (excluding rural finance loans) with a livestock component. Interestingly, the tighter control over credit in the Region's rural finance project seems to benefit livestock farmers; in many countries, close to half of the credit is devoted to livestock production and processing.

Currently the main challenges in international livestock development, as recently defined by selected World Bank staff (de Haan *et al*., 2001) are food security, environment, serving the poor, livestock and consumers and animal welfare. The main role of the World Bank includes ensuring an appropriate policy framework and access to knowledge, to resources (especially pastoral land), to financial services, and to services such as animal health and breeding. Ensuring access differs from providing access, the access can be also provided by the private sector but the state ensures equitable access and monitors the quality.

Access to markets is a major concern of producers. Unfortunately, the rules in the international market place are rarely providing for a level playing field, and developing countries' access may be limited. The reasons for the lack of a level playing field are economic (with subsidies and tariff protection for agricultural production in Europe, North America and Japan), and maybe related to slightly biased standards of quality and food safety[4]. The rules governing this are becoming so complex and costly that it excludes all but the most courageous third world producers.

Considerations for lending for investment in animal registration

Despite this complexity some countries feel that they have to join the momentum of food safety and greater control over livestock movement and product quality initiated in Europe in the late eighties and now followed by north America and other exporting countries. Some developing countries that are neighboring the EU or are exporting animal products to the EU, US or Japan are contemplating to adopt these "world market" standards. Moreover food safety is heavily promoted by international organizations such as the WTO and FAO[5]. One spin-off of

[4]For example, rules on food safety are aimed to protect consumers but a common spillover, i.e. the protection of local markets, can sometimes be the driving force.
[5]And not always for altruistic reasons, as the bureaucracies of these organizations may need these initiatives for survival.

the food safety movement is the desire to improve the tracing[6] of animals and animal products and EU rules now mandate to do this through individual animal registration and comprehensive food labeling.

Box 2. Stratification between public and private investment

Considerable literature exist about the issue of private versus public sector roles in investments and services, and the opinions vary and are still changing. With respect to livestock see Umali *et al*. (1992), Leonard (1993) and Gross (1994).

In general, public sector input is required for those activities where markets fail, where the benefits can not be appropriated to individual beneficiaries but are available to the whole community (i.e. public goods, such as food inspection and quarantine), where quality is not transparent (quality control of drugs and vaccines), or in situations where there are significant externalities ("spill over", i.e. compulsory interventions such as vaccination campaigns). The public sector also plays an important role to ensure fair and equal treatment of all aspects of society, especially the poor and disadvantaged. However, public investment should not lead to unfair competition with, or undercut, the private initiatives.

Private goods on the other hand are typical goods and services where the beneficiary is identifiable, understands the benefits and may be willing to pay or contribute in another way to obtain these goods or services. Typical private goods in the livestock sector are the purchase of feed and fodder, the purchase of breeding services (where farmers pay fully for either natural breeding or for semen and AI services), or the purchase of clinical veterinary services. The balance between private and public varies, and is largely based on the economic history of the country. For example, there is a clear dominance of the public sector in some countries such as Cuba and in many eastern European and former Soviet Union (FSU) countries. There is a sound belief in the benefits of the private sector in Anglo-Saxon countries and in capitalist countries in general. But even, in the latter group, there are clear differences of opinion. In the end, however, the private-public stratification, whether or not based on economic theory, is a political decision.

[6]Tracing animal movement is nearly as old as animal marketing (examples are branding of animals in the American West, in colonial Nigeria or in 16th century UK. See also Landais, 2001).

Affordability: Based on interactions with various borrowers, the main under-estimated constraint in food safety and animal recording components is affordability[7]. Animal recording in its current format is a concept and implement of western governments. Generally these are countries where farmers are heavily subsidized (and, also, where registration is a requirement for getting subsidies), where herd resistance to disease has diminished (compare for example the substantial impact of the British FMD outbreak in 2000 with a similar, but globally barely noticed outbreak in central Asia) and where fast food consumption makes consumers more vulnerable to multi-consumer food poisoning.

Farmer subsidization also increased the size of farms, and thereby reduce the transaction costs of providing farm services. Still, even in these countries there is considerable opposition to charge the full cost to the industry. After all, the public-private stratification may economically be correct – but not always politically acceptable.

For a wider debate about the affordability of food safety regulation see Antle (1999) who found that food safety economics are complicated by the difficulty to determine the costs, as the value of "food safety" itself is difficult to measure. Indeed, the food safety concept may be differently interpreted in different societies as food preparation and food consumption habits differ (for example, elaborate food safety checks for meat in a region where traditionally meat is boiled into a soup does make little sense). Shin *et al*. (1996) indeed demonstrate regional differences in willingness to pay for safer food products.

Animal registration and small-holders

There are a number of reasons why, especially smaller, developing countries have a problem to follow the rules and systems of their potential trading partners. Apart from the issues of tariff protection and subsidization, the main stumbling block is the mismatch between the sophisticated systems required for international trade and the transaction costs of reaching (and convincing) small-holders in developing countries. In the Netherlands, for example there are an estimated 30 000 cattle owners with 1.5 million cattle and an average of 50 cows per farm. In smaller Albania there are 310 000 cattle owners with about 430 000 cows or fewer than 2 cows per farm. Consequently the transaction costs of any farm service, including registration, in Albania are a dimension higher than in the Netherlands. Albania is not an exporting country and registration may not be urgent, and if farmers would elect to develop such as system it should be kept simple and transparent. Neighboring Macedonia, however, exports a part of its small ruminant production to the EU, and is more or less obliged to adopt an expensive registration

7 For review of food safety economics see Antle, 1999.

system for its livestock farmers[8]. This then becomes a difficult policy issue for Government as only a limited number of livestock farms are exporters (and beneficiaries), but EU rules require complete registration and tracing.

Apart from the scale issue (above) further problems relate to logistics of reaching a dispersed rural population in countries without good roads, telephone and reliable recording systems. On the other hand, labor costs are generally fairly low and fairly simple tracing systems can be designed (see Landais, 2001) that, however, are rarely accepted by international traders. The interesting associated problem is that administrators and researchers focus most attention on (blanket) adopting the systems from the West, and rarely spend resources on developing a cheaper local system that could potentially be accepted by trade partners and even by the World Trade Organization (WTO).

An additional benefit of individual identification is to help individual producers to identify best management practices and procedures. This is not an issue to small-holders who probably know their animals and their pedigrees by name, but will surely improve management of medium and large size farms . Some efforts have been made to develop recorded management systems by village or community (Faugère *et al*., 1991). Such systems appear to be cumbersome and expensive but may be useful under conditions of dispersed (small-holder) ownership.

Box 3. Implementation

In most western countries the implementation of animal recording is contracted out to parastatal or private organizations. In Canada, for example, the implementation is contracted to the industry created non-profit Canadian Cattle Identification Agency (CCIA). In the Netherlands the database is managed by the parastatal Animal Health Service (with oversight by the Livestock and Meat Commodity Board), in Tunisia by the parastatal Livestock and Rangeland Office. The UK, like the US, started with a mix of regional systems that are now centralized in the British Cattle Movement Service.

[8]Macedonia's lamb exports to the European Union were seriously hurt by a FMD outbreak in the Balkans in 1996.

Private or public investment

Traditionally, farmers identified their animals one way or another for the purpose of breeding or to prevent theft. In most family herds the animals were recognized by name. These were all private initiatives. More recently, however, the State (either directly or through parastatal organzations) has become involved in animal identification. Most of these tracing systems are currently being developeded, and the startup costs are generally carried by the State. The distribution of costs between the farmer and the state will depend also on the applications given to the identification. If it is only for food safety, there is a strong "public good" justification. Where producers would benefit also from the system through the use of breeding services, a larger share of the costs can be carried by the farmers. Indeed in most (western) countries an increasing part of the costs are carried by the livestock owners[9].

Box. 4 Should public sector support/finance animal recording?

Pro	• Control of movement and improved tracing will be overall beneficial to society. • Transaction costs of nomadic / transhumant herds, or for small holders, are too high to be carried by producers alone. • Better enforcement and statistics when state is involved. • Prevents tax evasion. • Public funds are needed to increase awareness and overcome producer objection. • Consumers may ultimatley benefit from safer products and from a lower risk of costly animal disease epidemics.
Con	• Benefits will be reaped by small selective group (livestock producers). • Intrusion of State in private activities (and risk of misuse of State power; first step to further intrusion, rent seeking and corruption). • Costly to producers and ultimately consumers. • Cost relatively higher to small producers. • Animal welfare objections against branding, improper use of ear tags etc.

[9]Assuming that tracing improves food safety, the consumers are as much a beneficiary as the producers. However, the cost allocation is easier by charging the producers, who should then include these charges in the costs of the final product. The downside is that some consumers do benefit more than others.

However, the cost of operating an animal tagging and identification system in developing countries is much higher than in most western countries, and some of these countries justify the involvement of the State for a number of reasons (see box 4). Such involvement does not necessarily mean the central state. In numerous countries the initiatives for public sector support derives from provincial or even lower levels of government. In India for example the cost of certain public sector activities are split between the central state and provincial Government. Moreover, these activities can be subcontracted to private entities such as producer cooperatives and other NGOs or to private veterinarians, private breeding services etc. Also, many of these models are based on trials on large farms and research stations, an environment that may not always represent the small-holder's system or interest.

Cost recovery

If indeed the industry has to pay (part of) the cost of the system an equitable method of cost recovery has to be established. Various tools are used. Most common is a levy on livestock sales or a levy on livestock ownership. Canada finances its CCIA through a Can $0.20 surcharge on the sale of eartags. The United States' (beef) Cattle Identification System (US-CIS; a voluntary non-profit organization) has been discussing three possible systems: (i) a surcharge to the purchase of ear tags, (ii) a fee per head, or (iii) a charge for services delivered (it was recognized, however, that in the latter case billing may be an issue).

Economic justification

Despite a vast literature about the technicalities of animal recording (See ICAR technical series) very little is known about its economics (i.e. benefits-costs). Disney *et al*., (2001) reported that, for the US, animal identification of cattle may provide "sufficient" economic benefits in terms of reduced risk of foreign animal disease, but that this may not be true for pigs. Their hypothetical study looked at a large registration system (40 million animals) for the United States. Their costs were low (about $2-2.50 per head) but excluded the start-up costs and the costs to the farmer. Start up costs vary but run somewhere between $ 500 000 to $ 4 000 000 for sizeable systems, which is low when amortized over millions of animals. The actual costs for the British Cattle Movement Service for 2000 / 1 were £. 22.6 million (US$ 33 million) but excluded the costs of inspection / quality control by the State (Hoskin *et al*., 2001). More telling may be a staffing of over 400 (just for the record keeping), which required about half of the overall operating costs. In contrast, the Canadian CCIA developed its database (from QC Data International, developed in about three years) for 14 million cattle with a State subsidy of Can $ 1.6 million and plans to

operate this with a staff of less than ten[10] funded by a surcharge on ear tags (currently Can$ 0.20). For comparison the US United Suffolk Breeders charge $5.- including tags.

Box 5. Broad outline of activities/actions

I. Feasibility

- Increasing awareness and dialogue about the perceived need.
- Determine "fit" with the national livestock strategy and market opportunities.
- Selection of competent implementation agency (for development phase) and sustainable financing mechanisms.

II. Planning

- Develop a national identification / movement control strategy.
- Determine which animals (species) to include in individual versus batch recording.
- Allocate necessary resources.
- Further education and information to increase awareness.
- Development of plan for database development and pilot testing.

III. Implementation (development phase)

- Project plan, budget and procurement method for developing database.
- Development of pilot plan and implementation.
- Development monitoring and quality control system.
- Allocate necessary budgetary resources for full implementation.
- Development implementation plan and procurement / tender.

IV. Implementation (execution)

- Prepare for full operation of system.
- System roll-out (phased).
- Monitor / assess operation and costs.
- Continue education and awareness improvement.

V. Post implementation

- Full surveillance / recording operating.
- Monitoring quality, costs and compliance.

[10]Personal communication, Ms. Stitt, CCIA.

Early - farmer initiated - programs, whether the objective was animal breeding or disease prevention, were indeed accompanied by crude cost-benefits analyses. Especially the breeding programs started locally, were farmer-initiated and managed, and the costs were fairly well controlled; much of the costs were kept down by volunteer services. Indeed even today some of the breeding programs are fairly cost effective. Review of such programs is relevant as they may provide lessons for countries or regions were breeding and animal control programs are currently being initiated.

Adoption of relatively expensive western models of animal identification is not only unaffordable in many developing countries but may be unnecessary. However this would require that farmers and their supporting bureaucracy make a sound case in international forums about the equivalency and compatibility of their systems[11], and that is the system is a best "fit" for their industry. Unfortunately this rarely happens.

Some experiences in World Bank projects

The World Bank has participated in the financing of a number of programs that aim to register animals. In some cases these were pilot programs to develop a system for demonstration or research purposes, in a few cases the project (component) financed a substantial part of the start-up and initial operating costs. As expected most of these programs are in eastern Europe and north Africa where the influence of the European Union is playing an increasing role in Government's decision making. In most cases the decisions to start an identification system are not well thought through, especially with respect to need, function, benefit/cost and budgetary implication. It is frequently seen as an extension of the breed identification system, without full appreciation of the implications of comprehensiveness, movement control and change recording, and the administrative costs of maintaining the database. A number of issues and experiences emerge, especially in policy dialogue and in project design and implementation. These include the following.

Policy

As discussed above the main policy issue is the justification of involvement of the state in a program that benefits only a small part of society. This is a political question that may have different answers in different countries, depending on the state budget, the perceived benefits to the country, and the economic and political power of the livestock sector.

[11]These differences stretch into the legal system views of liability. In the US the ex-post liability is largely driving the production and market system, whereas in Europe the control focused more on the product process and (state) control.

The second, somewhat related policy issue, is whether the Government's support should be provided to all producers (or regions) or only to those where the transaction costs are very high. In Tunisia, for example, the northern dairy farmers are well organized and use a European type of farming- and animal recording - system; in southern Tunisia, however, urban households may own one or two cows and there is a large transhumant sheep system. The latter are not willing and able to implement animal recording. To promote its uptake the Government is contemplating to financially support introduction of animal recording systems. However, the targeting of special groups is difficult for logistical and political reasons; and as such the northern dairy farmers may initially also benefit from Government support. But in other countries (and also expected in Tunisia), the large producers pay the full costs once the system is in place, but small-holders will continue to receive some state support. Again this is largely a political decision; in most cases the large farms (which may be exporters) are also the main beneficiaries.

Thirdly, the question to be posed in many countries is whether animal recording is indeed among the highest priorities in the long list of needs for improved functioning of the agricultural economy. In only a few cases have Governments presented a sound cost-benefit analysis and a system of cost recovery (but, as mentioned above, this is surely not only typical for developing countries). In a wider context this related to the overall costs of food safety program, which even in western countries may be prohibitively expensive (see below). Two additional policy questions that relate to state- or industry- mandated registration are the implications of mandated recording and the effect on the poor.

The political implications of enforced livestock recording

Especially in countries that just escaped totalitarian regimes there is a healthy suspicion among most livestock producers about State involvement. On the other hand there is great interest in recording etc. among the Government bureaucrats as they see this as a chance to claim back some of their power lost in the transition.

The effects on the poor

Enforced registration, especially with partly or full cost recovery from the producers may negatively affect the poor as there are strong economies of scale in animal recording. The poor producers[12] are rarely involved in either trading or moving animals around, and there may be few direct benefits to them, only higher costs and greater risks of being forced out of business because of non-compliance. The poor consumers will likely have to pay higher prices; in part because producers and processors have to

[12]Also in most developing countries, agriculture's share of the national economy is greater than in developed countries. Consequently, even if the costs are carried by the State, a large part will derive from the agricultural sector through taxes, levies etc.

recover their extra costs and in part because the official recording is sometimes combined with better taxation enforcement and consequently fewer opportunities for a (cheaper) gray economy[13].

Technical and financial issues

Technical and financial issues include underfunding and overall implementation.

Under funding

Some of the countries started the process of animal registration as an extension of earlier breed recording system. Apart from the infighting between various factions representing animal health or zootechnical interests, another common consequence is the under-funding of the program, as record keeping for tracing is very different, and more costly, than record keeping for breeding. Some countries were only interested in obtaining funding for the hardware (ear tags, some computers and programs) and grossly underestimated the human resources cost of managing and implementing an animal recording system as well as the time it takes to have a system in operation.

Implementation

As mentioned in some countries the breeders were the first to develop an animal recording system (i.e. milk recording). When a national recording system is proposed, the breeders feel that they should run the system, despite the fact that the objective of the nationwide system is tracing for animal disease control and food safety. On the other hand if the system is allocated to the veterinary profession there is a risk of a monopoly leading to relatively high transaction costs.

A common flaw is the lack of appreciation for proper movement control. An essential part of any registration system is compliance and control over movement of livestock. This is a crucial issue in the programs of many developing countries where animals are either free roaming around the village, take part in transhumant grazing and/or are moved on the hoof and there is an intermingling of animals from various owners. Movement recording, however, is the essence of animal tracing systems (and frequently the largest budget item of agencies managing animal recording). In pig and poultry production, the private sector (i.e. the vertical integrators) are increasingly taking the main responsibility for implementation (and for the costs).

[13]Some Governments (when dealing with small holders) recognize the high transaction costs and set a threshold below which it will not interfere (such as a income threshold for taxation purpose). This is not (yet) the case in food safety (and consequently animal registration) where a 100% compliance is expected.

The experiences in World Bank projects also point to the considerable time it takes to establish a sound recording system in countries where there is no history of recording and record keeping by farmers. Under such conditions the establishment of such a recording system may take at least a decade before being fully functional and with a reasonable assurance of quality data. Planners may keep this in mind when facing officials with optimistic scenarios of rapidly introducing such schemes. And international agencies such as WTO, Codex and even EU may also reflect about this when contemplating to require developing countries to buy-in and adhere to their rules.

Impact measurement

Finally, a common missing part of the project plan is the process of monitoring and the development of monitoring indicators. As mentioned above the impact of animal recording programs has rarely been quantitatively measured. Even in the EU, that has heavily promoted animal recording, the dearth of sound economic evaluation is striking. At most,

Box 6. Example of process and impact parameters

Process	Impact
• Number (or percentage) of animals or farms in the system. • Costs of registration per animal (per farm or per output) . • Turn around time when data have to be changed (especially related to movement). • Percentage incorrect data or (animal) passports. • Time it takes for producers etc. to obtain information.	• Improvement in response time to food scares or animal disease outbreaks. • Reduction in animal disease outbreaks or reduction in impact of food scares. • Improvement in food safety cost per unit product (i.e. before and after introduction of new system). • Rate of genetic improvement. • Satisfaction of major player (farmers, processors. • Ex post benefit / cost of investment. • Change in the number of disputes in national and international trade. • Change in turn-around time of trade dispute cases.

the evaluations use process parameters (number of farms or animals registered) or note the loopholes. Recent episodes on BSE and FMD demonstrate the existence of such loopholes and the difficulty of complete animal registration and movement recording.

The experience in the European Union with a long history of record keeping and sophisticated communication and database system does not bode well for the ease of introducing such systems in less well endowed countries. Proper impact measurement would require clear objectives of the investment, a baseline study, clear objectives and development of sound impact parameters. Apart from process parameters (see box 6.) a series of impact parameters need to be developed and monitored. In developing countries the parameters should include the impact on the poor (producers and consumers), and small versus large producers and processors and on sustainability in general.

Conclusion

Animal recording systems are not new. The comprehensive national systems that include tracing of animals, as recently mandated in the European Union and now in other countries, is relatively new. Most developing countries feel that they may have to follow the example of the large trading blocks and many may be forced to do so if their producers plan to export into these markets. Unfortunately the costs, and the benefit-cost of complete recording systems are not well documented, and governments planning to initiate a recording system may find that the costs and commitment are substantial, and that full implementation may take a decade. Especially non-exporting countries may carefully evaluate whether the costs of such system outweigh the benefits. Other countries may consider lower cost systems and argue that such systems are to be considered, under WTO rules, as equivalent and compatible.

Experience from the few examples of animal registration financed by the World Bank show a number of other risks, including under-funding the system, the lengthy debate and indecision about the implementing agency, a lack of appreciation that animal registration and tracing requires stricter movement controls, and the lack of quality controls. The need for monitoring the costs and impact should be an essential part of these programs.

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