» Impact monitoring: ICT-based methods create new opportunities

One Pager

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In the final analysis, the success of any development initiative is measured by the impact it achieves. But this often takes a great deal of effort to quantify. For example, to gauge the impact of a large-scale municipal development programme or an agricultural consultancy project, suitably designed surveys and analyses must be carried out in the project areas both before and after the project has been implemented. The results must then be compared with a control group comprising locations where the relevant measures have not been implemented, but which are as similar as possible to the project sites. It should then be possible – by means of some rather complex econometric methods – to determine the net effect of a given development intervention. Poor data quality and limited data availability often prove a major constraint in these situations, and collecting data through on-site interviews is generally both expensive and time-consuming.

But now, the data situation can often be significantly improved, in a manner which is both cost-effective and time-efficient – by using innovative, up-to-date information and communication technology (ICT).

Overview of recent ICT-based impact monitoring methods

Mobile communications and smartphones

Mobile network coverage has grown, as has the use of mobile phones (increasingly, smartphones with internet access). In many regions, this has now reached a level sufficient to allow large-scale user surveys – concerning, for example, satisfaction with the services provided by municipal authorities – to be carried out rapidly by means of an app, or through SMS messaging. These channels can even be used to send images showing the current condition or utilisation of infrastructure facilities.

Sometimes mobile or internet-based crowdsourcing applications can even be used to estimate whether levels of corruption or violence have increased or decreased, and the extent of any change.

High-resolution satellite images and drones

High-resolution satellite images are now available for almost every region of the world. They can be used in conjunction with pattern detection programmes for a variety of purposes: e.g. poverty mapping (by assessing, for example, the materials used in roof construction, or artificial light sources during darkness, or land usage patterns); estimating trade flows (by reference to the movements of ships, aircraft, or heavy goods vehicles); determining highway usage (based on traffic volumes); or, in an agricultural context, estimating yields per hectare. This information can often be evaluated retrospectively, thereby overcoming the problems posed by a lack of baseline data. Thanks to modern camera technology, unmanned drones offer even more flexibility, such as the capability to count wild animals in nature reserves.

Sensor technology/the Internet of Things

In many areas, sensors are already being used to support or automate operational processes, through the "Internet of Things". These sensors (or networks of sensors) produce a continuous flow of data. This can also be used for impact monitoring purposes: data such as a sewage treatment plant's purification performance, the energy produced by a wind power installation, or the water quality in a river system.

Big data analysis

In many cases, conclusions on the impact of an intervention can also be reached by analysing large volumes of data, or by combining different data sources. For example, movement data derived from mobile phones can often provide a good indication of the utilisation of different transport links; and similarly, power distribution statistics and broadband traffic volumes can offer a reasonably good guide to levels of economic activity.

In summary: limited experience, great expectations and a few limitations

To a large extent, the development of modern, ICT-based methods of impact monitoring is still in its infancy. But pilot projects are now providing the first really promising results, and in some areas, such as the use of satellite photographs in agriculture and forestry, substantial experience has already been gained. The range of potential applications seems almost unlimited.

That said, these technologies also have their limitations: in general, they can only be used to identify a status or a change in status, and not a causal connection. And not every developmentally relevant effect can be identified through satellite images, sensors, or mobile phones.

The use and suitability of such instruments must therefore be evaluated on a case-by-case basis. Until standard applications appear on the market, the initial development of these tools will require a relatively large outlay, and they will have to be adapted to suit each individual situation. Then, before being implemented, they must still be tested, and proven by means of random sampling. Often this will only be worthwhile in the case of projects which are extremely large or cover a wide territory. Data privacy obligations also impose very clear restrictions.

Nevertheless, the use of modern, ICT-based impact monitoring methods in development cooperation looks set to grow dramatically. ∎