

BFP Volta Data Volume, an example of multimedia support for the final report of an international programme

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Abstract The Basin Focal Projects, programmes of the CGIAR Challenge Program on Water and Food, were led to consider global condition of water, food and poverty. Ten rivers were selected to carry out this programme. We will show an example of how to build a final product, taking the Volta basin project as a model. BFP Volta began in 2005 and finished by the end 2008. The basin, of around 395 000 km², covers six countries, but 85% of its drained area is located in Ghana and Burkina Faso. The programme was carried out by specialists in the fields of hydrology, demography, agricultural production, climate, health and cattle breeding. Their different contributions to the results of the programme were gathered in a database and are displayed in a multimedia product. This communication will show the way an information system can be built, displaying the various data types collected within an international programme.

Key words multimedia product; data ownership; international programme; Volta basin; hydrology; demography; agricultural production; poverty; access to water

INTRODUCTION

The CGIAR Challenge Program on Water and Food (Anonymous, 2007) “believes that when considering issues of water productivity, it makes sense to focus attention at the basin scale. Hence, CPWF has selected 10 river basins as the focus of its research and development work located in developing countries of Africa, Asia, and Latin America”.

In Africa, the basins are the Limpopo, the Niger, the Nile and the Volta; in Asia, the Indo-Gangetic, the Karkheh, the Mekong and the Yellow River; and in Latin America, the Andean system and the Sao Francisco. For every basin, the programme has to draw an assessment on poverty linked to the access to water. Each team have a specific field of research, some provide data used by other teams, but they are mainly processed to a compilation of existing reports or sets of data. The terminal work is the base of knowledge, in charge of building either a website or any other product that collects all the databases or reports produced by the teams.

There is no specific format of restitution appearing in the BFP requirements; some have published paper reports, others built up the results in a website, depending on the human skills available in the programme.

The major concern of the leader of the BFP Volta was to provide the members with a clear and convenient product.

The programme

The BFP programmes are supposed to be a literature review; they are mainly dedicated to preparing the content of further programmes. Their aim is to collect the maximum number of pieces of information about, in our case, water productivity; the leitmotiv of the BFPs is “*more crop per drop*”. This is why a database was built with the data collected by the scientists in the form of Excel spreadsheets, text files, reports or statistic files, GIS layers in shapefiles or coverage format. A specific intranet interface was developed to enter the metadata and the files; the data files are stored on a server with secured access to BFP members. The DVD with the multimedia interface allows a wider circulation and a longer lifetime for the content. The scientists also elaborated reports or slideshows for the different steps of the programme and the meetings that

were organised during the BFP. Table 1 lists the distribution of files collected and/or created during the BFP and provided on the DVD.

Table 1 Organization of the DVD.

Folders on the DVD and items on the home page	Storage on the DVD	Number and type of files
BFPData	Level 1 = 6 sub folders Level 2 = 4 sub folders Level 3 = 7 sub folders Level 4 = 23 sub folders	223 .xls 131 .zip 104 .statistic 46 txt; doc, pdf
BFPGIS	Level 1 = 16 sub folders Level 2 = 11 sub folders	95 coverages 108 layers 1 .xls
BFPPublications		24 .pdf, 1 .xls
BFPSlideShows	Level 1 = 2 sub folders	17 .ppt

The content

The aim of this programme was to gather what had been studied on the basin linked to water use and draw guidelines for further programmes. The members were chosen for their expertise in their scientific field in this geographical area and for their capacity to drain the key data on the Volta basin. They were at the origin of the data acquisition or they were used to collaborate with the local data suppliers. A first arrangement was done by Jacques Lemoalle and Devaraj De Condappa and the organization of the home page of DVD was established in five items:

BFP publications

This part gathers 14 documents elaborated during the programme. They all are Acrobat files and the screen lets the user choose to browse one document by clicking on the square where the author's name appears, the date it was created, and the title of the document.

The BFP data

The files stored in this item are mainly text files or Excel spreadsheets, or even files in native format from statistical pieces of software (for population, and socio-economical data for instance).

The data available on this DVD are:

- **Agriculture:** this item contains data dealing with agricultural production in Ghana, Burkina Faso and Togo, the price of the agricultural productions, and also demographic data.
- **Climate:** this item contains data of rainfall, evaporation, temperature (minimum, maximum and mean), period of sunshine, humidity and wind.
- **Hydrology:** this item gathers the data of daily and monthly discharges during the period 1950–2005.
- **Population:** information is available for this data type from the census done in Burkina Faso in 1996 per village.
- **Poverty:** the data of the most recent enquiries about household living standards in Burkina Faso (in 2003) and Ghana (in 1999). Data has been published by the governments.

GIS

The spatialized data are gathered on this part of the restitution. Two categories can be drawn in these data: some can be found free on the Internet, e.g. true for the Digital Elevation Model shown, which is a clip from the SRTM (Shuttle Radar Topographic Mission from NASA and USGS), in

the part called administration; the data comes from the FAO Geonetwork. An intersection is done with the Volta basin limits to point out the parts of every country included in the project area. The second part consists of data coming from more specialized data. For instance, the map shown in the item pedology is an intersection of the Digital Soil Map of the World drawn by the FAO, and based on this map, a calculation of the Water Holding Capacity, derived from the FAO map, is also present; this one coming from SIEREM (Boyer *et al.*, 2006), an Environmental Information System developed by the HydroSciences Laboratory, Montpellier.

In the hydrology item the layers containing the rivers and the delineated sub-basins come from SIEREM, and can be browsed and downloaded from the website of the laboratory of HydroSciences, Montpellier.

The data dealing with land-use and soil usage are extracted from the Land Use cover from USGS/NASA.

The item called “agriculture” contains maps elaborated by the BFP; these are annual production and yield values that are shown by administrative division on the whole basin. This is done for a large range of agricultural productions (cassava, cocoyam, cotton, cowpea, fonio, groundnut, maize, millet, plantain, rice, sorghum, yam) for every year in the period 1992–2000. Only one year can be shown per image and all the values are in the attribute table of eve.

Here are also maps drawn on cattle breeding from a census on cattle, and the results of the census are represented per administrative entity (this for bovine and ovine species).

Bibliographic documents

This is probably the most important part of the restitution package, both for the content and the quantity of references (over 300). A specific module was developed on the website for the key entry of the references and the documents themselves. This was done to provide the members with common references. This part is also the most restricted, with copyright law protecting >50% of the content.

Slide shows

This part gathers the major slide shows projected by the BFP Volta during the meetings gathering all the BFPs. These meetings were held at least once a year. This is the contribution of the leaders in the programme.

What are we allowed to show? Among all these files, what are we allowed to distribute? This first question must be raised when considering this material. It is therefore necessary to classify the documents as: restricted data; confidential; or public.

These categories are the ones used to determine the data ownership:

- This concern of ownership must be in the mind of anyone displaying data, whatever the support is: book, report, internet website or multimedia product.
- If we examine the package gathered within the BFP, all these categories are present. For instance, the bibliography is thoroughly restricted data, due to the copyright. Some data present in the files provided by the members of the BFP can be set in the restricted data classification.
- The products of the BFP members for the programme, on the other hand, are public data. The reports, and the results of census that are published by the national institutions are public. This is also the status of all the data that have been edited.

It was difficult to draw a line between what would cause problems if widely spread and what could be delivered in a free product. The amount of information that was gathered during the BFP was so rich that it would have been a pity to cut a large part of it. This is why the decision was made to insert the whole package in the restitution product, but this product would be distributed only to the members of the BFP and the sponsors.

In this configuration, we provide it as a “private copy” and are allowed to provide all the collected data. But, concerning the bibliography, the solution, consisting of the storage of all the

documents on the secured and restricted access to website server, was finally adopted, and is displayed in the DVD only as a list of the documents, provided that every member is interested in only some part of the documentation and not in the whole package.

The choice of the medium

Most of the BFPs compiled reports in the form of a book. Another option for delivering the results of the programme is to publish it on a website.

A report can be heavy and thus expensive if it has to be disseminated widely. A website is dependent on server maintenance, and the regular payment of a subscription to a provider for the domain name. As soon as one part goes wrong, the site is down and definitely unavailable. The idea of a multimedia product seemed to be the best support.

During the programme an intranet website was created to provide the members with a space where they could exchange data with other members. The access to this intranet was secured by the need to enter an ID and a password; only the members of the BFP could access it.

Gathering the results of the programme on a DVD offers several advantages:

– compared to a paper report:

Scattering is cheaper.

The existing tools allow displaying of the content in a more attractive way.

The content is ready to be shown, e.g. during a meeting.

Any data file or report can be accessed very quickly.

– compared to a website:

The DVD can be browsed on any computer, no need to have an Internet connection.

The DVD is maintenance free, no need for a server, webmaster and domain name provider. A DVD's lifetime is only dependant on the conditions where it is stored. If those are decent, it can be longer than the interest in its content,

The DVD can easily be disseminated, it was decided to download an ISO image of the DVD on the CGIAR website, in a space where only the BFP members can upload it.

The choice of the presentation

Two major products are available for developing such a product: Flash and Director. The choice was made to use Flash (2007). This software allows an emphasis on the production of the maps that have been drawn during the programme.

A strip made of photos, in a blue/white two-colour process appears on every screen of the DVD. The main menu is shown in Fig. 1).

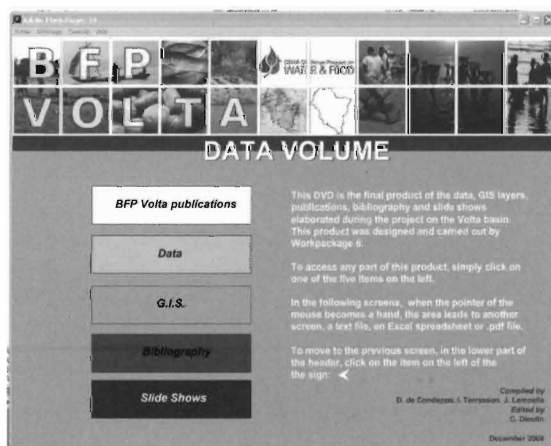


Fig. 1 DVD menu.

The *BFP publications* consisting of reports, all in .pdf format. The link is done using the Acrobat icon (see Fig. 2).

For the *Data* item, we created maps for access to the data, e.g. every hydrological station is displayed with the data types and the period present on the DVD. The colour of the text corresponds to the origin of the data, which is mentioned on the screen (Fig. 3). A click on the data type and period opens the text file or the spreadsheet linked to the text.

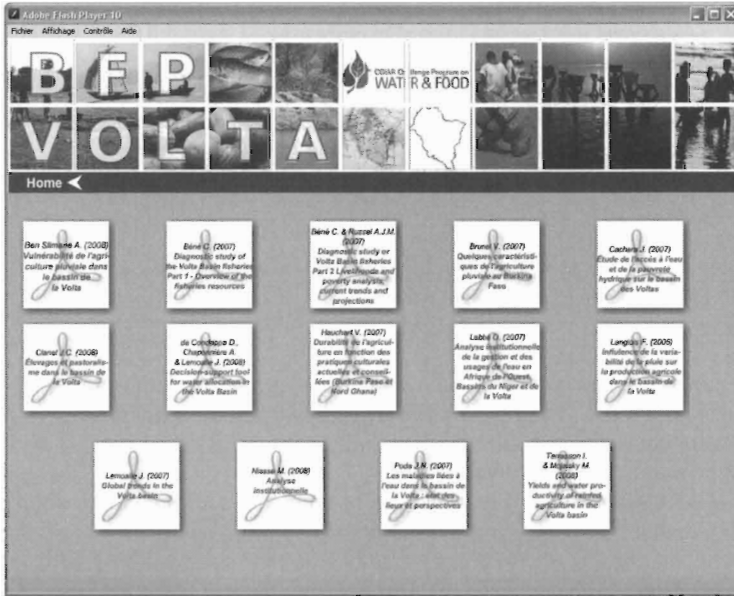


Fig. 2 BFP publications.

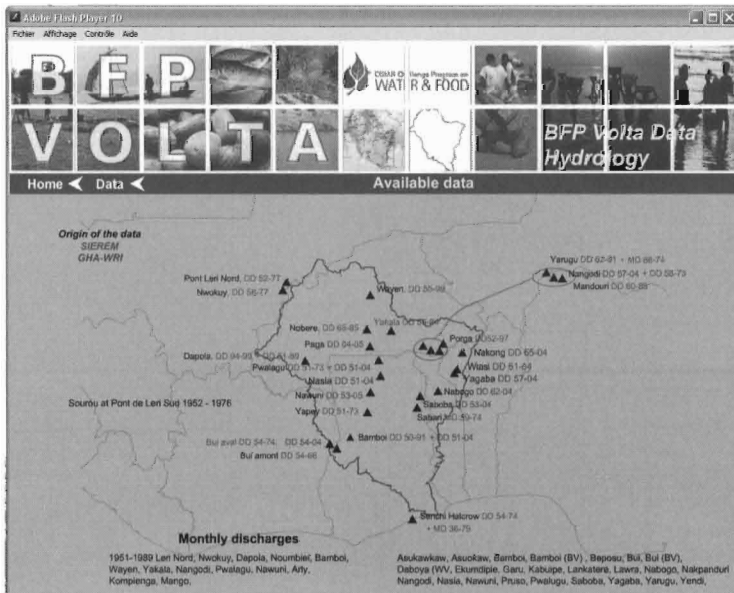


Fig. 3 Example of screen to access the data files of the hydrology item.

The process on the GIS layers was the most time consuming one. Every layer or coverage has been exported as a vector image, at the same scale for all of them. Obviously, only one field of the attribute table could be displayed, we generally chose the most recent one. The other fields of the attribute table are mentioned next to the map.

The maps have been gathered by themes, the menu of the GIS is in Fig. 4. Every theme contains several maps, every map is a button and when the mouse cursor is set over the name of the layer, the content of the layer is displayed (Fig. 5).

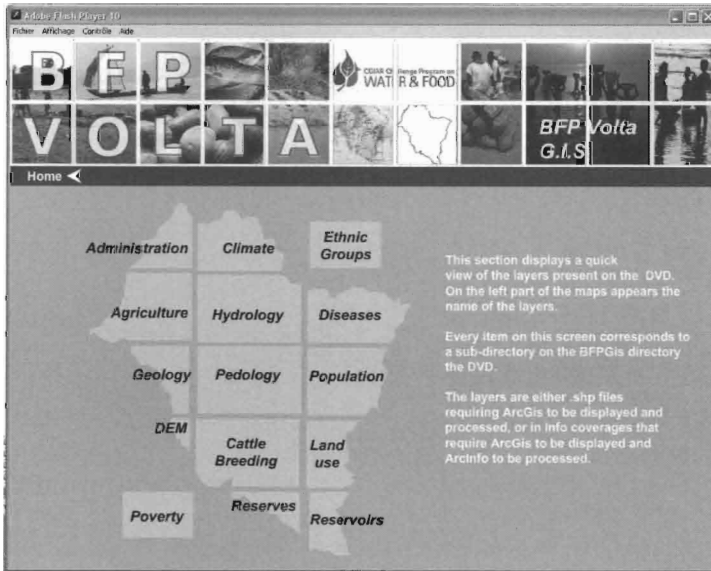


Fig. 4 GIS menu.

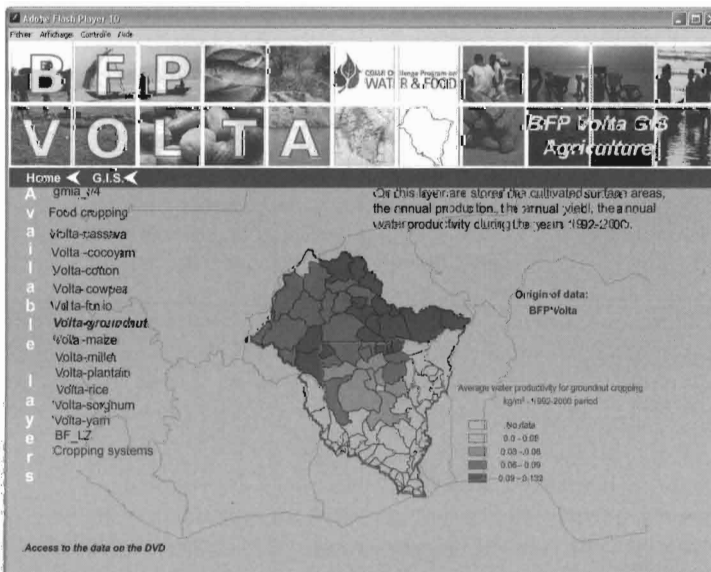


Fig. 5 Example of GIS layers display on the DVD, here the production of groundnut. The legend of the represented field is displayed, the origin of the map is always mentioned.

The *slide shows* item is displayed more or less the same way as the one for BFP publications, except that the icon is the one of a slide (Fig. 6). A click on the square opens the PowerPoint file.

Figure 7 is an image of the scenario in Flash; it shows the organization of the product. Every black circle is one “page” of the “animation”.



Fig. 6 The access to the Slide Shows. From any sub-level of the DVD, buttons permit to go back to any level backward up to the home page.

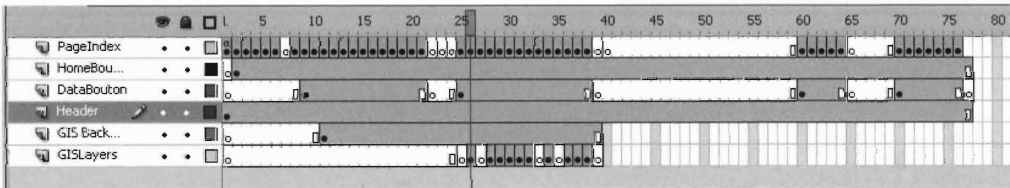


Fig. 7 The “scenario” window in Flash.

CONCLUSION

This Data Volume is an example that a programme dealing with a great number of data of various types can be gathered and shown in a clear and attractive way, provided it is strongly based on a solid database and clearly managed. The multimedia presentation is the way to add a value to the database, it permits the information managed within the research programme to be perpetuated. The file formats such as Acrobat allow storage of a large number of documents on a DVD. The example of the data files represented as points on a map allows an overall view of what is available on a single screen. The Flash player allows a very quick skip from one image to another.

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