EMERGING ISSUES IN THE MANAGEMENT OF FLOODS IN GHANA

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ABSTRACT

Evidence of flooding in Ghana (then the Gold Coast) appears to date as far back as the year 1936. Since then flooding has become a recurring phenomenon causing the flooding of major Ghanaian cities and conurbations on an unprecedented scale. A review of the extant literature on flooding in developing countries reveals a dearth of research in the context of Africa and Ghana in particular. Using content analysis, the organizational and structural themes emerging from Ghanaian Newspapers with respect to the management of flooding in the last 10 years are identified, analyzed and reported. The findings reveal that the Ghanaian flood risk management strategy is currently in need of further development. It is contended that, with an increasing population and growth in human settlements, the worst effects of flooding might be ahead. This requires detailed analysis and policy direction towards developing and promoting a holistic risk management plan for flood recovery and response. This risk management plan should embody a robust and well-packaged educational programme towards raising awareness and understanding of safety measures one should adopt in the event of a flood.

Keywords: flood response, Ghana, risk management, safety awareness, well-packaged education, West Africa.

1 INTRODUCTION

Flooding is an inevitable phenomenon but in recent years, flooding of major Ghanaian cities and conurbations has been the cause of disasters on an unprecedented scale [1]. A review of popular Ghanaian newspapers brings to the fore major feature headlines such as: 'Any solutions for *Accra* floods' [2]; '*Accra* experiences severe floods' [3]; 'Construction after the floods' [4]; 'Search for causes after the floods' [4]; 'Flooding, a matter of concern in *Kumasi*' [5]; 'Floods render about 1000 homeless' [6]; 'More floods' [7]; 'of floods and other matters' [8]. Indeed following an exploratory study by Ahadzie and Proverbs [1], it was revealed that flooding (at least in recent times) has become a perennial problem and that the impact of such events might be worsening given the relatively weak economic, organizational and technological organisation of Ghanaian risk/disaster management structures. Thus, typical of many developing countries south of the Sahara, increasing urbanization and unprecedented growth of human settlements is beginning to have very serious repercussions vis-à-vis the impact of floods in Ghana.

Indeed the flooding of cities is an unavoidable international phenomenon, but recent events suggest that the impacts are becoming more severe (cf. [9]). However, there is no doubt that African countries such as Ghana face a most major threat because they lack appropriate measures to limit the effect [10]. In Ghana, much debate has often gone on in the print and electronic media on how best to control and address the aftermaths of flooding. However, a full understanding of the recurring challenges is very much desired especially given that research on floods is currently gaining attention the worldover (cf. [11–13]). Here, content analysis is used to help establish the emergent themes for understanding and making relevant recommendations for further research and also towards developing an appropriate risk management model.

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A review of the available literature is first presented emphasizing the copious dearth of flood recovery research in Africa, even though the enormity of the threat posed is well acknowledged and recognized. Subsequently, a synthesis of the Ghanaian print media is presented to provide some compelling reality of the gravity of the situation. Hence, the research design including data collection procedure follows. Discussions of the critical issues arising from the review are then presented. The conclusion encompass recommendations for the way forward which could also be useful for many other developing countries, especially those south of the Sahara.

2 LITERATURE REVIEW

Presently, Ahadzie and Proverbs [1] and Konadu and Fosu [14] represent the only known publications relating to floods and flood recovery research in Ghana. Also, within the sub-region, the only known work that can be acknowledged is that of Fadairo and Ganiyu [15] which focused on Nigeria. The worsening effect of floods in Ghana seems induced largely by recent human activities such as, poor and unregulated construction practices, and inadequate drainage systems that are also poorly maintained. Besides, there is poor consciousness of the inhabitants on the environmental information and inadequate spatial information on flood prone areas that needs to be confronted. Fadairo and Ganiyu [15] also share similar sentiments in their observation of the Nigeria situation.

As noted by UNECE [16], Africa has the world's second largest area of undisturbed tropical forest inducing an average annual rainfall of between 250 mm and 500 mm, and sub-Saharan Africa lies in this high induced area. Thus, increasing population and human settlement activities in Ghana could mean more exposure to the devastating effect of floods. Indeed in 2009, Africa lost at least US$ 152 million due to damages in a period of only 4 months [17]. No doubt, the development of Africa is at its burgeoning stage and floods pose an enormous threat which has to be managed if the continent is to have any prospects of realizing and sustaining the very much needed accelerated development [18]. Africa's situation is indeed also very worrying with respect to higher mortality risk, given that 96% of all deaths recorded in floods occur in developing countries (cf. [18]). At such a critical period when research on flooding is gaining attention all over the world, the significance of this study in the Ghanaian context cannot be over-emphasized.

3 HISTORY OF FLOODS IN GHANA

The earliest available evidence of recorded flooding in Ghana (then the Gold Coast) dates as far back as 1936 [8]. However, in Ghana's modern history, the flooding of 1995 and 1999 seems to have gained prominence as the country's worst flood disasters in the recent past [19]. In 1995, the floods claimed 26 lives whilst 56 lives were claimed in 1999 [19, 20]. In particular, it is in the very recent memories that the effects of floods have gained prominence because of the increasing population and the growth of urban settlements. Unprecedented coverage within the print and electronic media over the last decade has also helped in bringing the effects closer to public scrutiny.

Ghana comprises of 10 regional boundaries namely; *Greater Accra*, *Ashanti*, *Central*, *Volta*, *Eastern*, *Western*, *Brong Ahafo*, *Northern*, *Upper East* and *Upper West Regions* (see Fig. 1). Table 1 provides a summary of the chronology of floods events reported in the print media between 2000 and 2010. The table reveals that flooding has been a persistent problem over the decade responsible for many casualties [21–25]. For instance in 2001, 13 people lost their lives in some part of the *Greater Accra and Central regions* [8].

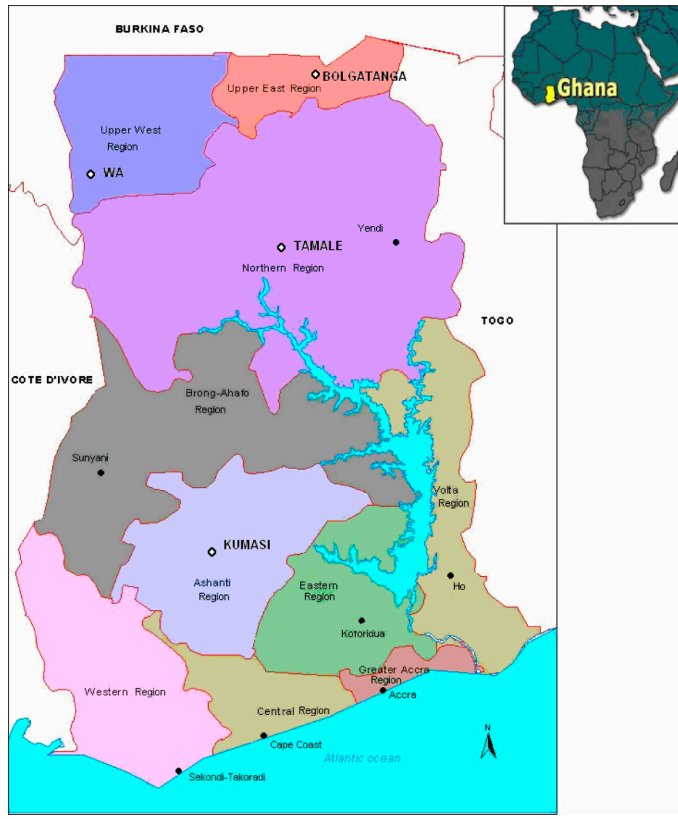

Figure 1: Showing regional boundaries in Ghana.

Contextually, the worst effect of floods occurred in September 2007 where 260,000 were affected and more than 35 people died in the three northern regions [23, 24]. In addition to these casualties, 12,220 hectares of farmlands were destroyed resulting in the loss of 13,895 metric tonnes of foodstuffs; 29 roads under the Ghana Highway Authority totalling a length of 427.4 km were also damaged; 54 feeder roads with a total length of 542 km and 68 bridges and culverts were also destroyed [25, 26]. In view of the magnitude of these floods, the Government of Ghana declared a state of emergency in the three affected regions. The flood of 2007 also recorded deaths in other countries such as Nigeria, Burkina Faso, Togo, Niger, Somalia, Morocco, Sudan, Uganda, Rwanda, Kenya and Ethiopia [27]. In August 2008, the Daily Graphic [28] confirmed four people dead and 150 rendered homeless also in *Accra*, and only last year, 2009, heavy rains flooded about 24,000 homes affecting some 350,000 people across West Africa including Ghana. The death toll which included people from Burkina Faso was 32 [29]. Just recently the Ghanaian Times [30] reported that a total of 26 people were feared dead in three regions of Ghana following torrential rains. Within the same context, the Daily Graphic [31] reported that 35 bodies had been retrieved from floodwaters across the country. Figure 2 establishes some trends in the average annual rainfall and its impact on some of the notable floods [5, 32–36]. The most striking finding from Fig. 2 is that while the average rainfall is declining, the impacts (in terms of deaths) have increased in recent times.

Table 1: Some chronology of floods as reported in Ghanaian newspapers.

Year	Nature/characteristics	Impact	Regional spread
1936	Not reported	Not reported	
1995	Devastating	26 lives lost	
1999	Devastating	56 lives lost	
2000	Devastating	Properties destroyed	Floods occurred in Cape Coast in the Central Region
2001	Devastating	At least 13 lives lost	Flood occurred in Accra in the Greater Accra region
2002	Devastating	At least 3 lives lost in the capital Accra and Property worth million of cedis destroyed	Floods occurred in Kosoa in the Central region, Accra in the Greater Accra and Sekondi-Takoradi the Western region
2003			Did not come across any known report
2004	Devastating	200 homes destroyed and about 1000 people rendered homeless	Floods occurred in Kumasi in the Ashanti region
2005	Devastating	Properties destroyed	Floods occurred in Saltpond in the Central region
2006			Did not come across any known report
2007	Devastating	32 dead, several properties and infrastructure destroyed	Floods occurred in Accra in the Greater Accra region, upper east regions, upper west and northern regions, Some West African cities such as Nigeria, Burkina Faso, Togo, Niger and Ethiopia
2008	Devastating	4 dead	Floods occurred in Accra in the Greater Accra region
2009	Devastating	32 lives lost	Burkina Faso also affected
2010	Devastating	35 lives lost	Death toll was across the country

4 RESEARCH METHODOLOGY

Content analysis is a detailed and systematic examination of the contents of a particular body of material for the purpose of identifying, patterns, themes or biases [37]. Content analyses are typically performed on forms of human communication including books, newspapers, films, television, and art, music videotapes of human interaction and transcript of conversations. Generally, the researcher has the choice to sample the entire body if dealing with a small body of knowledge. Alternatively, if the researcher is faced with a large volume of data spanning number of years, a sample (perhaps random sampling) is selected. Almost invariably, one crucial step in

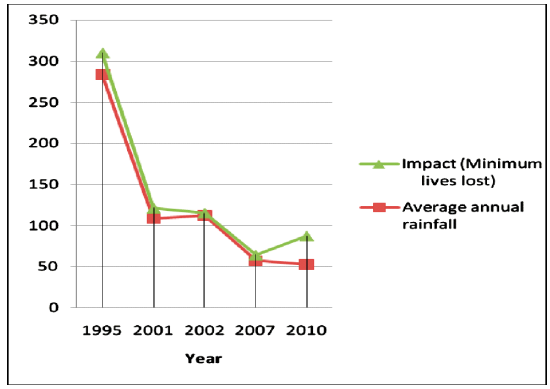

Figure 2: Average rainfall levels in the Greater Accra region of Ghana.

content analysis is to tabulate the frequency of each characteristic found in the material being studied. Thus content analysis tends to focus at a more micro-level often providing frequency counts and allowing for quantitative analysis of qualitative data. Themes within data can be identified in one of two major ways: inductive or deductive (cf. [38]). The inductive approach presumes that themes identified are strongly linked to the data themselves. By contrast, the deductive approach is driven by the researchers' theoretical or analytic interest. It is, however, to be noted that notwithstanding the choice of the inductive approach, researchers cannot free themselves from their theoretical and epistemological inclinations. Thus, whether the choice is inductive or deductive, the data would almost always be coded in some epistemological setting (cf. [39]).

In Ghana, the print media landscape is quite proliferated and vibrant with 20+ newspapers in regular circulation. Some of the popular papers are the Daily Graphic, the Ghanaian Times, The Spectator, the Mirror, the Searchlight, The New Crusading Guide, The Daily Dispatch, the Enquirer, the Concorde, the Palaver, the Democrat, the Insight, the Lens, the Chronicle and the Pioneer. The papers reviewed were obtained from the serials department of the Main Library of the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi. The Library subscribes to single copies of the Daily Graphic, The Ghanaian Times, and the Pioneer and also the weekly editions of the Mirror and Spectator. The Daily Graphic, the Ghanaian Times, the Mirror and the Spectator are state owned and widely circulated. The Pioneer albeit private is also an influential paper in the second largest city of Ghana, Kumasi. A database of these popular newspapers have been created by the Library and as of 2008, about 42,276 records had been kept [40].

Here, the data collection approach was first to scan through the computer and search all captions on floods. Using the serial numbers and page numbers the specific newspapers identified were then requested for, retrieved from archives and thoroughly reviewed. In all, a total of 167 papers were reviewed, 84 in the Daily Graphic, 66 in the Ghanaian Times, 4 in the Mirror, 10 in the Pioneer and 3 in the Spectator. Table 2 captures the breakdown of the flood-related issues that appeared in the selected papers. The Daily Graphic and Ghanaian Times featured the most articles. Table 2 reveals that the year 2000 and 2006 recorded the very least coverage of articles, respectively (one item each). This probably suggests that the floods experienced during these periods were not intense and caused little public alarm.

The themes identified in Ahadzie and Proverbs [1] largely formed the basis for searching for the patterns in the news reported. This helped to form an initial view of the kind of themes

Table 2: Sources of newspapers reviewed.

Year	Daily graphic	The Ghanaian times	The Mirror	The Pioneer	The Spectator	Total
2000	1					1
2001	8	2		1	1	12
2002	7	14		2	1	24
2003	2	2				4
2004	1			2		3
2005	9	1		1		11
2006		1				1
2007	23	33	2	4		62
2008	19	8	2		1	30
2009	9	2				11
2010	5	3				8
Total	84	66	4	10	3	167

to be looking for. Following various readings, the following keywords were studied: prediction, relief items, causes, response strategies, international response and education initially emerged. However, subsequent and more detailed scrutiny revealed that, some of the themes could be merged as they were invariably addressing the same issue. In the end, the themes that emerged predominant were coded and transferred into quantitative data as shown in Table 3.

Table 3 indicates that during the period under review, effects and causes were the most recurring theme, followed by relief items, education and rescue. Generally the trend supports the earlier findings of Ahadzie and Proverbs [1] even though the previous study covered a shorter 4-year period. Additional themes that have been introduced here are those relating to feature articles, research and forum. The lack of well-packaged risk awareness and evacuation plans is still reflected in these findings. While feature article/forum could be classified as part of education, here they have been separated to emphasize their uniqueness. The feature articles are pieces of essays that journalist and in some cases experts write to generate debate on how best the devastating effects of the floods can be managed. Admittedly, these feature articles are useful for educational purposes as they do provide some useful insight and knowledge. However, the focus as observed from the reportage has often been repetition of what is already known on the causes of these floods and the potential suggested solutions. Alternatively, forums are occasions where the public are invited to give their opinion of the floods as captured in the weekly edition of the Mirror. Research as captured was a caption for one of issues in the newspaper. However, it turned out that the content of the piece was more of consultancy and not necessarily research in terms of promoting knowledge.

5 EMERGING ISSUES

Evidence gathered suggests the following emerging issues:

- Floods have become a perennial phenomenon in Ghana and indications are that their impacts are generally becoming more severe. In particular, while rainfall levels are declining the impact in terms death tolls is rising.

Table 3: Percentage representation of themes.

Action	Count	Percentage	Remarks
Predictions	5	3.07%	At the time of concluding this paper, the Bagre Dam had just been opened and reports indicate that 56 people already dead
Effect and causes	65	39.88	
Relief items	52	31.90	
Education	13	7.98%	Education in terms of effective risk management plans for flood recovery
Rescue	5	3.07%	A rapid response team comprising the NADMO. This reportage is linked to the Bagre Dam alert
Feature articles	21	12.80	Though educational do not very much reflect risk management concerns
Research	1	0.6%	Turned out to be consultancy and not research
Forum	3	0.8%	
Total	165	100	

- The gravity of the situation has assumed a national dimension and cities across the country are potentially flood prone.
- Judging by the average annual rainfall figures it can be argued that in Ghanaian cities flooding can no more be attributed to natural causes of rainfall but rather exacerbated by uncontrolled and unregulated growth in human activities/settlements.
- The scale of the problem is so enormous and complex that Ghanaian authorities/ stakeholders are overwhelmed by the situation.
- Typical of many developing countries, Ghana lacks any systematic and well-tested prediction structures to warn people of impending floods.
- There is a lack of well-integrated risk management model towards addressing the safety awareness, evacuation needs and psychological needs of potential victims.

6 DISCUSSION OF RESULTS

The analysis has revealed that, within the last decade (2000–2010) Ghanaian mass media has reported in some depth the occurrence of floods and the ensuing havoc it can cause. In a developing country such as Ghana, it is not surprising that the response strategy as indicated in the analysis favoured reportage on the effects of flooding and the provision of relief items. Natural disasters as they are, flooding demands that politicians quickly visit such places to show solidarity with potential victims and in most cases providing relief items is the obvious thing to do to win sympathies and show some concern. With politicians in attendance the media obviously also have the obligation to give enough coverage including emphasizing the devastating effects of the flooding. Thus, it makes political as well as socio-economic sense that the reports tend to focus on the effects of the floods and also highlights of the provision of relief items (cf. [1]).

In Ghana, a National Disaster Management Organization (NADMO) is responsible for coordinating the activities of the relevant bodies for managing all disasters including floods.

Consequently, in the event of floods, it is common to find the NADMO constituting a rapid response team often comprising of the Navy, Airforce, the Police, The Red Cross, Civil Aviation and the Health Services. While it could be argued that the NADMO is doing its best given the resources available in the context of a developing country, one major obstacle to their operations is that they can only offer advice to people in the event of disasters as they have no power of enforcement to evacuate.

Obviously, the rapid response to issuing relief items is crucial and very much needed in such disasters. However, establishing a better understanding of flooding and its prediction is also crucially important towards developing an effective response strategy. Here, the findings have revealed that very little or no risk management strategy is in place to predict and warn victims of a potential flooding (3.07% out of 167 newspapers reviewed). This is contrary to for instance some parts of the US, where the national weather service provides a flood warning service by operating a river and flood forecasting service through 85 offices located at strategic points along major river streams [36]. This office issues river and flow forecasts to the communities along flood prone rivers and streams. Indeed in many other western countries, as part of the prediction strategies, rivers that are characterized by floods are often managed by defences such as levees bund, reservoirs and weirs to prevent rivers from bursting their banks, however, here in Ghana there is no indication of any such systems as evidenced in the reportage. Note that the very minor prediction system observed is largely related to the opening of the overflow of *Bagre* and *Weija* Dams (see Table 1) rather than a systematic prediction of the general flood situation. What is even worrying is that with the prediction facility associated with the Bagre Dam alert, Ghana is still not able to effectively manage the situation as evidenced in the 56 lives lost this year following the opening of the dam.

This study supports the findings of the exploratory works earlier reported in Ahadzie and Proverbs [1] especially with respect to the lack of a well-developed flood risk management plan. However, this extended study has revealed that at least some attempt has been made (representing 7.98%) towards education especially with regards to safety awareness and evacuation plans. For instance, in one such press release by the NADMO, residents were advised on specific locations to congregate and what to do relating to important documents and valuables such as certificates and personal documents. Emergency phone numbers were provided and parents were also advised to educate their children on some precautionary measures they needed to take when flood occur (Daily Graphic, June 2010). In an unprecedented move, the *Ellembelle* District Assembly in the *Western Region* organized a forum to educate the community and also seek their opinion on the way forward before the rains set in. In terms of raising community interest at the local government level in flood recovery and response strategies this move by the *Ellembelle* Assembly was quite innovative and unprecedented in Ghana's local government administration. The only drawback was that the forum focussed on infrastructural provisions to help minimize the effects of the floods and failed to consider issues relating to evacuation plans and safety awareness of what to do in the event of floods (Daily Graphic, June 2010).

By far the most comprehensive educative material appeared in Mirror of Saturday April 12 2008. This gave very elaborate suggestions on what people should do when floods occur both indoors and outdoors. Some of the very useful advice for indoors is that one should be calm and not panic, switch off all electric and power mains, move to the roof top if necessary and possible, vacate rooms when the flood water is at ankle level, and if flood current is swift one should not stay too close to walls especially weak walls. For outdoors, some of the suggestion are: one should never wade across the water if the level is above ones knees, one should take

up shelter only behind strong walls, one should not attempt to cross open drains covered by flood waters, if in a vehicle one should not attempt to drive through flooded areas and or covered bridges, if one has the means, vehicles should be secured to a strong tree or any strong structure left in low-gear with hand breaks on and all windows firmly closed. Laudable as this is, the weakness is that, in a country where literacy rate is about 60% and reading culture is also low, newspapers items cannot go far in making an impact on the general public. There is therefore the need for the NADMO to be more innovative in getting any risk management plans to the core of the populace who obviously need to be educated.

The Global trend suggests that flooding is a threat to many human settlements and indeed is likely to be a major concern in the future especially in countries like Ghana where risk management plans seems under developed. It is clear that while it is important for developing countries like Ghana to focus on improving infrastructure development towards controlling the worst effects of floods, it is also now critical for equal attention to be devoted towards developing an appropriate and integrated risk management programmes towards promoting education on evacuation strategies and associated safety including the psychological coping needs of potential victims and flood insurance. It is contended that, with the current situation in Ghana, the lack of awareness amongst communities on evacuation and safety awareness is potentially dangerous and could compound the effects of floods. It is therefore high time that innovative strategies are put in place to develop a robust and well-packaged education of the general public on evacuation and safety awareness programmes in the event of floods.

The good news is that, the NADMO has demonstrated at least in its press release in 2008 that it has some knowledge that can be used in educating the public. It is now time for this to be considered as a matter of urgency so that very aggressive and constant well-packaged information can be provided all over the country. The NADMO should be able to use this experience to launch a more vigorous and constant educational programme using all fronts including the electronic media (e.g. TV and radio) on flood evacuation and management drills. There is also the need for well-packed educational policy and strategies in place to sensitize potential victims on flooding and post-flooding events. In this respect, flood education should be introduced into the basic schools curriculum so that school children at all levels would be well prepared and conscientised on the future implications of an impending flood. The forum set by the *Ellembelle* district Assembly could be a model that could be improved and adopted around all local/government areas for community education in floods. Inevitably, risk management including flood insurance is an issue that Ghana cannot ignore especially given the fast pace of infrastructure development. There would be the need for a study to develop an appropriate risk management approach in Ghana, which could form the basis of an insurance package for future flood management. Ultimately, research into understanding the cultural and socio-economic implications of flood response strategies would help in understanding appropriate risk management options to be provided in this context. This would require research and knowledge building in understanding the cultural issues involved on the perceptions of floods and barriers to flood risk management.

7 CONCLUSION

Flooding is a perennial hazard in many developing Ghanaian cities. However, flood risk management strategies are unclear and in need of further development. Using content analysis, the emerging themes from Ghanaian newspapers over the last 10 years have been identified. The findings reveal that while flooding has become a perennial problem in Ghana, disaster managers and stakeholders are overwhelmed by the gravity of the situation. The

most striking revelation is while rainfall levels are declining, the impact in terms of deaths is rising. However, often, flood recovery and responses are spontaneous lacking a holistic risk management approach. It is contended that the lack of a well-planned evacuation and safety awareness programme could lead to serious implications with regard to future flooding in Ghana. Within this context, an appropriate and robust risk management strategy encompassing an understanding of the psychological coping needs of potential victims is also crucial. Recommendations provided are that the NADMO in Ghana should pursue an aggressive educational drive to raise awareness of safety and evacuation strategies as part of this risk management plan. A policy towards incorporating evacuation response strategies, safety and psychological coping needs of victims in schools curriculum is also advocated. Ultimately, research towards understanding the cultural and socio-economic issues involved would be very pertinent. Principally, it is argued that Ghana needs to pay attention towards developing a comprehensive flood risk management model to help overcome the challenges that lie ahead.

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