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STORK PILOT PROJECT

Assessment report – Aug 06

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I. General context

Madagascar, situated in relative isolation in the Indian Ocean is regularly victim to the passage of devastating cyclones, which do destroy in just a few hours major infrastructure including roads, dams, schools and hospitals. Classified among the PPTE[1], the country, which is already burdened with trying to fulfil enormous social support obligations, finds itself continually challenged by cyclones that serve to reverse or limit progress.

All too often the impact of school destruction is so severe due to cyclone destruction in some annually vulnerable areas so that children can loose one or even two full education years.

One good solution that has been put forward is to construct strong buildings that serve as both schools and as local community temporary cyclone shelters during severe weather warnings. However, these constructions are very expensive and even with maximum investment would serve to address less than 20% among 16,000 needed school buildings. It would take many years to cover all vulnerable areas throughout the country.

Following the passage of the Gafilo cyclone in the Northeast part of Madagascar in February 2004, the Norwegian Government contributed to the rehabilitation effort for damaged school infrastructures by financing the reconstruction of nine anti-cyclonic buildings of two-classrooms each. In parallel, teachers capacity strengthening was undertaken in closecollaboration with the Ministry of Education. A communal mobilization effort also permitted the establishment of community ownership of these building in respect to their assuring their maintenance over the longer-term.

A complimentary project was also initiated during this period. CARE, an international NGO, and also funded by the Norwegian Government, undertook a pilot initiative to construct and test 5 classrooms of slightly different designs that could survive for the most part during a cyclone, and importantly, be easily refurbished during the initial post-cyclone period through the use of available local materials, thus ensuring the expeditious resumption of educational programs. Designed by Karel Stork, a Norwegian Engineer, and known as “Stork Classrooms” each classroom incorporates a light but tough and durable prefabricated infrastructure, including the use of tensile cables that help protect against violent storms, and local materials (such as traditional roofing) which can easily and quickly be replaced at very low cost.

The 5 classrooms were constructed in a 2 week period each by the community members themselves, and notably, with only moderate technical supervision. The entire project was completed before the start of the new school year in September 2005 under the guidance of Karel Stork who assisted in the project’s oversight and compliance to the different technical designs.

The objective of this assessment is to determine the perception of the beneficiaries towards these light “Stork” infrastructures following 12 months of use.

[1] Highly Indebted Poor Countries

1. Generalities on the project

An important element of the design is to allow local communities whom have suffered from cyclone to quickly rebuild classrooms by themselves. For this, light metallic structures, easy to transport and to be installed, and which could be covered with local materials are used.

The major benefits of this type of school infrastructure are threefold:

- The erection of the main structure and the collection of locally available materials are simple and can be undertaken by the villagers themselves in a matter of days only.
- The prime reinforcing aluminium made material is light and can be transported easily into very difficult access areas.
- The cost per room is about 6,000 USD, which is approximately 3 times less expensive than an anti-cyclonic building, and the removable structures, which are recoverable and reusable, are guaranteed over 50 years.

It is well understood that this type of building is not meant to replace the standard anti-cyclonic buildings the Ministry of Education continues to slowly but surely construct.

However, they are an excellent temporary alternative in the vulnerable cyclonic areas and serve to avoid a substantial and prolonged period of halted education.

Regardless, it is important to assess, before progressing further, the direct users perception who are the schoolchildren and their teachers.

2. Sites allocation in the region of Antalaha (see map in annex)

The five Stork prefabricated classrooms are located in the following villages:

- Ambodibonara, situated in the ZAP of Antananambo and approximately 6 km before the bridge crossing the Ambinany River
- Andamasina, situated approximately 16 km west of the RN5 A in the Zap of Antsahanoro
- Sahantaha situated about 16 km from the city towards the direction of East Cape. This site is in the Zap of Ampohibe
- Ambodimangamahatsara, situated at about twenty kilometres from the city on the RN5A
- Ambodimangan'Andempona, located approximately forty kilometres from the city on the RN5A.

II. Methodology

As already noted, the objective was to obtain the beneficiaries' impressions about the buildings, especially their perceptions related to the prefabricated classrooms functionality. A questionnaire survey was used. This was followed by collective or individual interviews of beneficiaries and personalities within the Cisco[2]. These activities were then completed with on-site direct observation.

Works were undertaken through three phases of one week each: Preparation of the questionnaires and interview forms; Information, data collection; Analysis and synthesis.

III. Survey

This required observing directly each classroom with beneficiaries including the physical status of the prefabricated building in each school. During this observation the consultant closely inspected the current building situation and inquired from the beneficiaries, information about already undertaken maintenance.

IV. Results

1. Buildings current condition

Observations from beneficiaries were mostly associated with the type of building materials used, in particular for walls. Those classrooms whose walls were made of brick were reported to be still in very good shape; this is the case at Ambodimangan'Andempona and Ambodimangamahatsara on the RN5 A[3]. These two buildings are indeed in very good condition and are really appreciated by their recipients. One reason why bricks were used for these classrooms is the availability of material close to the main road.

The three other villages are much more isolated and the classroom's walls are made of local materials such as kasaka (maize) and falafa (coconut leaves). They are still in good condition and appreciated by the beneficiaries, but require more maintenance work.

It is also useful to note that, of the five buildings, those of Ambodimangan'Andempona and Sahantaha were constructed without windows, and this definitely had an influence on the recipients appreciation. More light is needed.

[2] Educational Division in charge of local schools
[3] Main Road number 5 A

The table below provides a quick beneficiary satisfaction overview:

Site	Materials used for walls	Existence of windows	Physical status of the building	Satisfaction level of the beneficiaries
Ambodibonara	Plaited bamboo	3 windows	Good	Satisfied
Andamasina	Plaited Falafa	1 pair of windows	Fair	less satisfied
Ambodimangamahatsara	Bricks	1 pair of windows	Very Good	Very satisfied
Ambodimangan'Andempona	Bricks	No windows	Very good	Very satisfied
Sahantaha	Plaited bamboos	No windows	Good	More or less satisfied

2. Individual survey results

The pupils appreciation (favourable or not) reflected comments concerning the shape of the room, its dimensions and the inside temperature. For the five classrooms built in the region, the majority of the user pupils are favourable to the concept.

Pupils questioned	Pupils opinion		Positive Considerations		
	Favorable	Not favorable	Temp°	Shape	Light
97	65	32	46	27	6

65 pupils against 32 out of the 97 interviewed are favorable to the use, thus a percentage of 67% favorable against 33%.

3. Results of collective interviews

a) - Parents Vision

Parents' observations were first assessed through their interest in Stork buildings for getting children into school in their own village (instead of walking several hours)

For all five sites, parents are unanimous to stress that this type of structure is a good way to solve the lack of classrooms problem.

For them, this kind of school building is very convenient, because not only is it easy to build in a short time at lower cost, but also it is simple to maintain and to repair because of construction materials availability.

b) - Teachers Vision

In general, teachers from the five sites are in favour of the use of these Stork prefabricated buildings.

According to them, these buildings meet perfectly the required working criteria in the current teaching policy; the dimension of the room is adapted to the normal ratio pupils per teacher, which is about 40 to 45 pupils per teacher. They also indicated that the temperature inside the room is pleasant in all seasons, and the building's shape is already adapted to the new teaching methodology for groups, i.e. ability to use "training corners" as required by pedagogy for groups.

c) - Cisco Vision

For the educational staff at Cisco level, the Stork type prefabricated buildings presents an ideal solution to the lack of classrooms problem. According to them, the Stork classrooms are easy to be built even in isolated areas that contractors cannot reach, and are easy to maintain by the local population because of the use of simple construction technologies. These buildings also respect the main criteria of the government's policies concerning the teaching:

- Room' size in conformity with the maximum number of pupils required (45)
- Room's inside temperature.

Of course, if they could choose, the Cisco staff would prefer the anti-cyclonic buildings constructed with cement blocks (such as the FID buildings) because of their solidity and also because they would not necessarily need major repair after a cyclone. However, they did indicate that there are not enough FID type buildings since they are very expensive and that the smaller Stork structures would constitute a temporary fast solution to their problem, in particular for isolated areas.

V. Reflection about the building

1. Pupils choice

Most pupils among the five sites prefer the Stork type prefabricated building but suggest some changes in terms of construction materials choice.
65 pupils (67%) have chosen Stork classroom and 32 pupils (33%) have chosen FID type permanent building. Nobody chose the traditional ones.

2. Parents and communities choice

Even for this area, the Stork classroom presents many advantages especially in terms of costs and maintenance which farmers would be able to achieve, parents prefer the FID type permanent building one.

The reasons for their choice are given below:

a) –The FID permanent buildings are strong.
For everybody, FID type permanent buildings have been designed to resist to strong winds and bad weather that the area is suffering from every year.
For parents, these buildings can used both as school for children and shelter for communities in case of cyclone.

b) – FID permanent buildings are cheaper in terms of maintenance
Parents have noticed that FID permanent buildings are cheaper in terms of maintenance because they don't need to be fixed after a cyclone, contrary to Stork type prefabricated classrooms.

3. Education staff choice

According to responsible people within the Cisco, although the Stork prefabricated buildings present all advantageous conditions (such as the short time to build, lower costs, building materials availability on the ground and building techniques accessible to communities) to solve lack of classrooms, they still prefer the FID type permanent buildings. The mentioned reasons are the same as what parents express.

For the responsible people within the Cisco, FID permanent building doesn't need to be fixed many times.

For the two last cases (parents and education staff), it is obvious that anti-cyclone buildings present numerous advantages and cause fewer problems. Of course, they don't take costs into consideration nor children opinion.

VI. Beneficiaries recommendations and suggestions

a) – *Pupils suggestions*

For the majority of students (Stork classroom users or not), in order to better adapt the building to the teaching and learning conditions, suggestions are submitted in terms of:

- Changing local materials for roofs and walls into standard construction materials: roofs made by kasaka into sheet metal to avoid repairing frequently; bamboos or falafa walls into bricks to make the classroom stronger.
- Adding or installing more windows in order to allow more light inside the classrooms.

b)- Parents Suggestions

For parents, the main enhancement for the future Stork classroom constructions consists (during the constructing time) in taking 2 weeks longer to construct. It has to be noticed that during the pilot project, the structures assembling was made in 3 days and required a high level of mobilization from the population.

c) Suggestions from Teachers and CISCO staff

For a better adaptation of Stork prefabricated classrooms in terms of pupils education within the area, teachers and education responsible people suggest some improvements on the 2 main points below:

- Heighten a little bit the Stork classroom roof in order to let more light get inside the room and to allow the pupils who seat far from the board to see better.
- Add or install more openings (windows) according to the walls type: 5 at least for those made of local materials (in falafa or in bamboos) and 3 at least for those made of bricks.

VII. Synthesis and analysis

1. Beneficiaries opinion

a)- Building usefulness

Regarding the Stork type prefabricated classroom, all beneficiaries are convinced that this kind of construction is really useful to solve the lack in terms of school buildings problem. Advantages are: available and less expensive construction materials, short building time (2 weeks maximum) as well as construction, maintenance and repairing techniques easily accessible to everybody. Moreover, Stork classroom has advantageous criteria in terms of pupils' teaching and learning such as its size and the internal temperature that are in accordance with the required norms in terms of government education policy.

b) – The ideal school building

The ideal school building for beneficiaries after comparison between the three school building infrastructures within the area:

- FID or Cresed type permanent building
- Stork type building
- Entirely local materials made building,

Pupils' opinions are divided into two proportions between FID building (1/3) and Stork classroom (2/3). But for parents and communities, the choice is for the FID type permanent building.

2. Consultant's analysis

a) – Stork classroom advantages

Sharing the same opinion as the 05 sites beneficiaries, we are convinced that Stork building presents more advantages for this area and even for all areas throughout the country because it is more practical, easy to build and fits to all area spots. It is in a way the passe-partout kind of school building that could fit in town as well as in countryside.

This kind of building can work with all available construction materials: kasaka, bambous, sheet metal, bricks or others… and doesn't require any specific technical knowledge for its construction as well as its maintenance.
It is no doubt the ideal solution to solve the lack of classrooms problems for distant and enclosed countryside because all of its framework elements (metal girder, …) can be transported on man's back.

b) – Building's choice

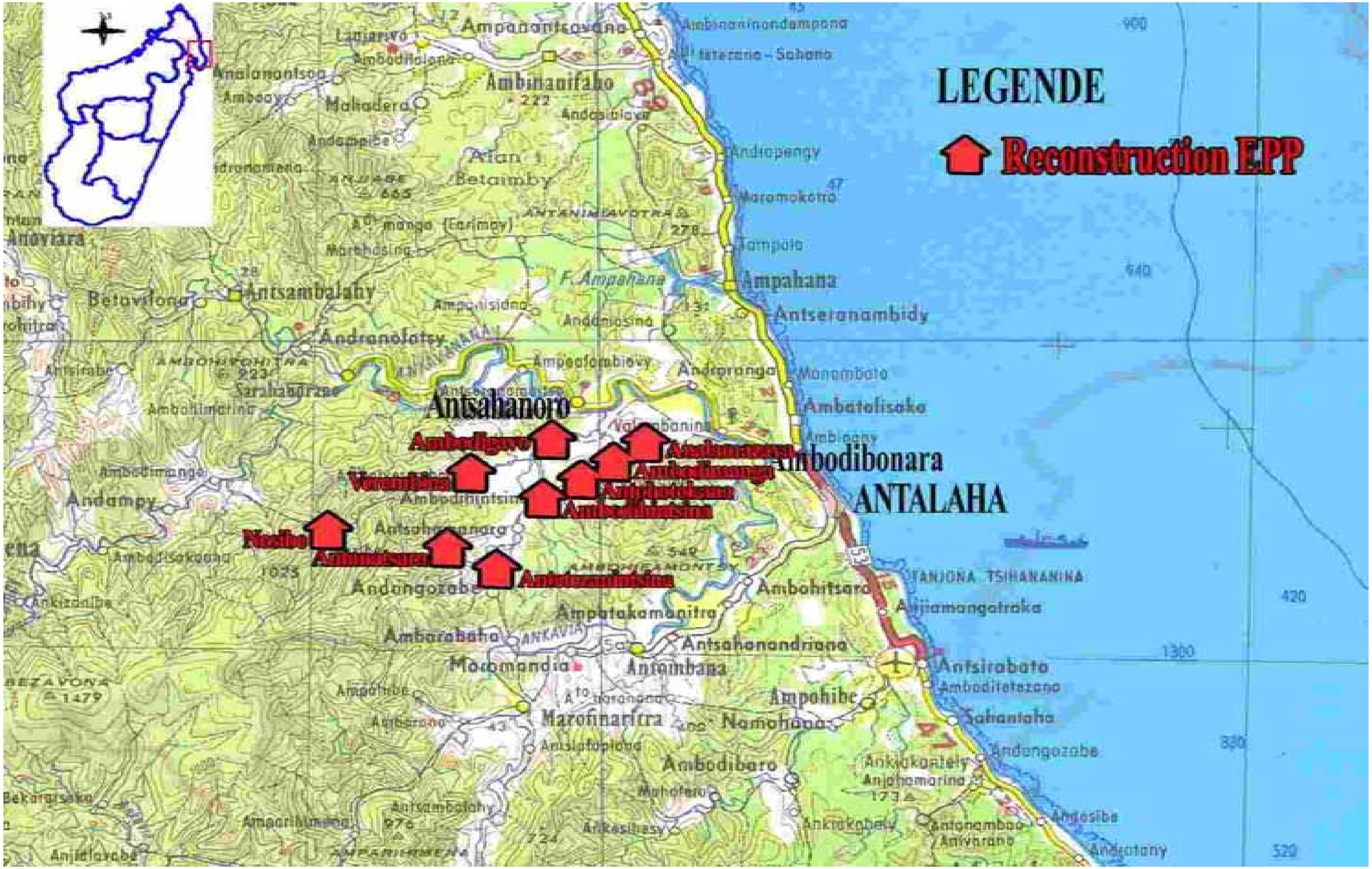
Regarding the FID type permanent school building chosen by the majority of consulted parents and communities, in our opinion, the choice came from a comparison that was not realistic from the beginning.
We compared two completely different realities that involve an obvious choice from beneficiaries. In fact, to ask a population globally vulnerable within an area regularly devastated by cyclones to choose between an anti-cyclone building and a prefabricated classroom that is not strong enough to face bad weather leads to biased answers.
The comparison would have been realistic if we had compared Stork building with the hangars (substitution buildings) that communities construct with local materials in an emergency need in terms of classrooms, or just after cyclone devastation.

Moreover, beneficiaries didn't take into consideration the financial implication because their responsibility is limited to provide non-skilled labor or local materials. On the other hand, if communities build a school by themselves, they have to cover all costs.

Some buildings with two classrooms, which FID recently built in the Cisco of Antalaha, cost up to Ar 80 millions (about $37,000) according to distance.
The Stork option allows costs reduction, proportional increase in community contributions in terms of local materials, time savings and also to build in areas where it is difficult or even impossible for FID to go.

VIII. Suggestions and conclusion

The current building statement reflects differences in terms of fixtures level for the Stork building construction. (Various materials durability). This underlies the beneficiaries appreciation towards their Stork classroom.
According to the consultant, if at the beginning, CARE project had used the same materials for all sites, beneficiaries satisfaction level would have been the same everywhere.
The kind of Stork building which matches the real education needs and the children wishes in the region would be the one which adopts definitively the brick walls option, at least up to mid-height and which is a little longer, in order to allow important class numbers to seat in.
Furthermore, more openings have to be installed for light.
In conclusion, in spite of some opinion differences between beneficiaries in terms of Stork building appreciation, they globally consider that this type of school structure would be able to solve quickly at a lower cost the lack of classroom problem in primary as well as in secondary schools in the area.


LEGENDE
Reconstruction EPP
Antsahanoro
Ambodibonara
ANTALAHA
Ampahana
Antseranambidy
Ambatolisaka
Ambohitsara
Antsirabato
Antsahanandriana
Antombana
Marofinaritra
Ampohibe
Ambodibaro
Andampy
Andongozabe
Ambinanifaho
Antsambalahy
Andranofotsy
Anoviara