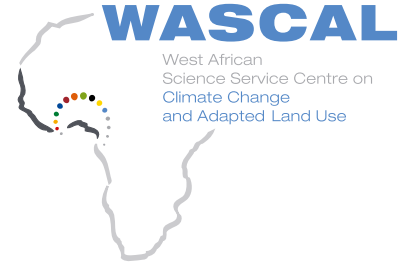




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WASCAL

West African
Science Service Centre on
Climate Change
and Adapted Land Use

Farmer Innovation Contest

Winners 2012-2015, Ghana



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Editorial

by Dr. Tobias Wünscher



This booklet presents the winners of four annual farmer innovation contests in Upper East Ghana, from 2012 to 2015. The contest was implemented together with local partners including the Ministry of Food and Agriculture (MOFA), the non-governmental Navrongo-Bolgatanga Catholic Diocesan Development Office (NABOCADO), the research organizations Savanna Agricultural Research Institute (SARI) and Animal Research Institute (ARI) as well as farmer representatives. Overall, we received 314 eligible applications, of which 31 innovations were awarded. Four of the innovations were evaluated scientifically by SARI, after the farmers had been awarded. Three of the four innovations received supporting evidence for their effectiveness. All other innovations have not undergone scientific evaluation. The authors therefore cannot guarantee their effectiveness but invite readers to do further testing.

The booklet addresses farmers, extension workers, development organization agents as well as scientists. We hope that the booklet motivates various stakeholders to integrate the described practices into their daily work: Farmers can find potential solutions for their problems and try out some of the practices, extension workers can tell farmers, scientists can conduct further experiments, and development organizations can consider local farmer innovations in their development programs.

The work is far from complete. The innovation descriptions are largely based on the original wording of the farmers as used in their application forms. Scientists may find it tedious to see that the utilized local plants and herbs are presented with their local names only. However, we considered it appropriate to share this “incomplete” information in order to stimulate developments in the field without further postponement. We wish all readers to find inspiration in what is presented here.

Terms

A local farmer innovation is defined here as a technology, practice or institution along the food chain which is different from common or traditional practice and which is developed primarily by a farmer or a group of farmers without external assistance such as by extension agents, researchers or development workers. Other initiatives such as PROLINNOVA (Promoting Local Innovation) use descriptions that are similar to the definition provided here (PROLINNOVA 2012).



Dr. Tobias Wünschler during a selection committee workshop.

The objective of this project was to identify farmer innovations in Upper East Ghana. Using an innovation contest, awards functioned as incentives for farmers to share their innovations. The brochure outlines how the innovation contest was implemented, and how it evolved across the years.

Contest Implementation and evolution

The contest was implemented in Upper East Ghana, a region within the Sudanian savanna. Upper East Ghana is among the poorest regions of Ghana. The major agricultural tool is the hoe. Access to modern techniques is limited. Farmer innovations can therefore make an important contribution to agricultural development.

The contest was announced using different communication channels. The most important channel was the local extension service by the Ministry of Food and Agriculture (MOFA). In addition, radio stations were used as the second most important communication channel. In 2012, the regional public radio station for Upper East Ghana, URA, was contracted to broadcast 1-minute jingles in five different languages (English, Guruni, Kusaal, Kasem, Buli).

Eligible applications were scored by an independent selection committee. The selection committee consisted of local experts including farmers, MOFA agents, NABOCADO members, researchers from the University of Development Studies, UDS (only in 2012), SARI and ARI. The exact composition of the committee changed over the years, depending on





The contest was announced by the extension service by the Ministry of Food and Agriculture and through radio stations.

the contributions.

Applications were scored based on four criteria, namely 'innovativeness', 'economic potential', 'dissemination potential', and 'environmental and social sustainability'. We developed the selection procedure, switching in 2014 to a workshop format, in which committee members jointly evaluated, discussed and scored applications.

The selection committee members interviewed and challenged the short-listed applicants and, occasionally, family members and colleagues, and reconsidered their scores based on the field experience. A round of final voting then determined the contest winners.



Members of the selection committee 2014 discussing the best applications in terms of innovativeness, economic potential, dissemination potential and social sustainability.

The farmers received their awards during the celebration ceremony of National Farmers' Day, usually on the first Friday of December each year. National Farmers' Day is organized by MOFA who also awards other farmers for their accomplishments in best practice farming, so the contest was well embedded into an existing local awards' structure.

Results

Most applicants were male farmers (79%). We did not receive institutional or organizational innovations. All proposed innovations were technical in nature and had been implemented, on average, more than a decade before the contest was started (2001). This tells us that most innovations were not developed in response to the contest. The contest rather identified already existing innovations. Whether the contest also triggers the development of innovations is subject of a different study and is not reported here. Most of the received applications addressed problems in animal husbandry (186, or 59%) followed by post-harvest storage techniques (51, or 16%) and crop management (39 or 12%). Other innovations address soil fertility, forest management, and adding value to crops.

According to Hayami and Ruttan (1985) innovations are induced by prices/costs, scarcity or, more generally, problems and challenges. If the theory holds in our context we may conclude that disease and pest control are predominant problems of small scale farmers in Upper East Ghana. Therefore, the addressed problems are likely a subset of the most pressing problems, reflecting those types of problems which farmers can actually address in an innovative way with locally available means and resources.





The first winner of a Farmer Innovation Contest in 2012, John Akugre Anyagre, won a tricycle.



Romain Abbieli, one of the winners of the Farmer Innovation Contest 2012, was awarded a motorcycle.

Tobias Wünscher was the project coordinator of the Farmer Innovation Contest (2012-2015) at the Center for Development Research, Germany. He works at EARTH University, Costa Rica, from September 2016 onwards (during which time this brochure was elaborated).

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Farmer Innovation Contest

2012

The Innovator

JOHN AKUGRE ANYAGRE

John Akugre (64) is a very engaged farmer from Tilli, Ghana. His innovation addresses the problems of insect pests during storage and is already adopted by more than 200 farmers. In the Farmer Innovation Contest 2012, John Akugre's innovation was among the three winners.

Winning Innovation

THE USE OF BARAKUK HERB TO STORE ONION SEEDS

This innovation prevents attacks from insect pests on onion seeds during storage and improves germination. The germination percentage can increase to up to 90%. Compared to the traditional and rather common practice using the Barakuk herb in its dried state, this innovation uses its ashes and improves thereby the impact and effectiveness. The cost for material and labour only consists of collecting, buying or cultivating the Barakuk plant. Processing is quick and easy.



How does it work?

After collecting the Barakuk herb it is dried, charred and pounded. The ash is then mixed with onion seeds and stored in an air tight container. As the Barakuk herb only grows in certain areas, it is recommended to cultivate it independently. Cultivation has been tried out successfully.



The Innovator



ABDUL RAMANI ABIELI

Abdul Ramani Abieli (35) is a passionate farmer from Pusiga in Upper East Ghana. Since 2001, he has successfully controlled Striga on his farm using the described innovation. By the time of the contest, 50 people had already adopted the practice. His innovation was award winning in the Farmer Innovation Contest 2012.

Winning Innovation

STRIGA CONTROL IN MILLET AND SORGHUM

Striga is a serious pest plant that destroys crops in large parts of Africa. With this innovation, Striga can be controlled and yields increased. Mr. Abieli, who is also an onion farmer, found that parts of his sorghum fields were free of Striga. He realized that those parts were identical with the areas where he had dumped onion leaves, a harvest residue. He applied smaller quantities to the remaining field – with the same result. Later on, he discovered that even mixing the dried onion leave powder into the sorghum seed would have the same effect. As an onion farmer, the innovation does not involve direct expenses, only a bit of time for processing.



How does it work?

After harvest, the onion leaves are formed into a small ball, available in the market place. The ball is then dried and ground. Afterwards, the seeds of millet or sorghum are mixed with the powder. Some amount of water is sprinkled on to help the powder stick to the seeds. Per acre, half a ball of onion leaves is sufficient. This prevents the germination of Striga in the field.



The Innovator



JOSEPH ABARIKE AZUMAH

Joseph Abarike Azumah (55) is an innovative farmer from Bolgatanga in Upper East Ghana. His special interest is fish farming and cropping, which is why his innovations address both areas. His innovation was one of three winning innovations in the Farmer Innovation Contest in 2012.

Winning Innovation

LOCAL FISH FEED AND RECYCLING FISH POND WATER AS MANURE

In response to the high cost of commercial fish feed Mr. Azumah formulated fish feed from local ingredients. Moreover, he recycles the fish pond water by using it as an organic manure for his crops. In this way, he closes the production cycle.



How does it work?

The local fish feed formulation consists of: 20 bowls of flour, five of rice bran, five of pito mash, two of soy beans, two of Amaani and five bowls of Baobab ground leaves. Recycling the fish pond water as manure works in the following way: First, fill fresh water into the pond and stock the pond with fish. Feed the fish daily with a mixture of one bucket each of cow dung, poultry droppings, sheep and goat manure and two bowls of locally formulated fish feed. Optionally, cut a branch of 'Mim' with leaves and put it in the pond. Mim is a natural local insecticide. When the water is too 'green', pipe out the water for irrigation of own crops. When insects invade the farm, the water can be used as a spray.





MINISTRY OF FOOD AND AGRICULTURE
29TH NATIONAL FARMERS' DAY CELEBRATION
THEME: REDUCING POST-HARVEST LOSSES FOR SUSTAINABLE
FOOD SECURITY AND NUTRITION
DATE: 6TH DECEMBER 2013 *TIME: 8:00AM*
VENUE: ASSEMBLY GROUNDS, BEHIND BONGO RURAL BANK
GUEST OF HONOUR: HON. REGIONAL MINISTER U.E.R.

Farmer Innovation Contest

2013

The Innovator

NMAA Nso

Nmaa Nso (36) is an innovative farmer from the region Anazobise in Ghana. As a participant of the Root and Tuber Improvement and Marketing Programme she is a very engaged farmer. Her innovation for the improved storage of Bambara beans was developed in 2008. Four farmers have already adopted her innovation since. She was one of the winners of the 2013 Farmer Innovation Contest.

Winning Innovation

STORAGE OF BAMBARA BEANS BY MEANS OF SHEA TREE BARK

This innovation reduces damages to Bambara beans during storage and assures high germination percentages. If consumed, the taste is maintained when the beans are cooked. The costs for its application are small. They consist of labour time for collecting the material and fuelwood to heat water. The innovation is safe to use and no protective clothes are needed.

How does it work?

First, the bark of the Shea tree is scraped off with a cut glass, knife or axe. The practice is environmentally sustainable as long as only the top part of the bark is scraped off. The bark is put into a pot of hot water for a short while. Then, the Bambara beans are poured into the hot water and the hot water is drained immediately afterwards. Now, the beans are dried in the sun and finally stored in any suitable container. This can be a pot or sack. It is important to store them in a cool and dry place. The beans look good and are viable for up to six months.



The Innovator

PAUL ATANGA

The guinea fowl farmer Paul Atanga (43) from Navio in the Upper East Region developed and constructed a type of semi-detached poultry housing providing protection, coops for nesting and ventilation for the birds. It also allows to cater for the special needs of sick and very young individuals. His winning innovation was rewarded in the Farmer Innovation Contest in 2013. This innovative idea was developed in 2012 and had been adopted by two more farmers by the time of the contest. He reports that there is further potential for improvements.



Winning Innovation

CONSTRUCTION OF POULTRY HOUSING FACILITIES IN RURAL COMMUNITIES USING NATURAL MATERIALS

In 2012, the farmer Paul Atanga developed and constructed a system of semi-detached housing for his fowls with walls built from natural materials available at the farm. The housing facility provides protection for the birds as well as enough space for coops for laying eggs and nesting. Special departments are built for very young chicks as well as sick poultry, making it easy for the farmer to feed and treat birds with special needs. This way stress and diseases are reduced for the guinea fowls. At the same time, the farmer has control over the population and its movement since the housing structure is located in his yard. Trees inside the construction provide shade and shelter the birds from overheating. On top of that, the birds can feed on the flowers and seeds of the trees in times of feed shortage. Mr. Atanga's innovation has already been adopted by a couple of farmers in his community.

How does it work?



The walls for the poultry housing facility are built from natural materials found at the farm, i.e. mud and grass. The soil is dug and rolled into balls. After that, the design of the facility is laid out and pits are dug. Finally, the walls are built with a mixture of mud and grass supported by a rod structure. The poultry houses are roofed with grass to further control the movement of the birds. The innovation is feasible for one-man farms, however the work is labour-intensive and may require helpers to build sufficiently high walls. Furthermore, a reliable water source is needed in the community to mix with soil and grass as well as credit to buy bitumen to seal the walls.



The Innovator



AYANDOO ANANZAAYA

Ayandoo Ananzaaya (65) is a dedicated crop and livestock farmer from Zuarungu in the Bolgatana Municipal. On his farm he rears fowls, guinea fowls and small ruminants. In 2010, he found an effective way of treating fowls affected by the Newcastle disease. He added pounded Dawadawa seeds to the drinking water of his fowls which reduced the mortality significantly. His innovation won an award in the WASCAL Farmer Innovation Contest in 2013.

Winning Innovation

TREATMENT OF NEWCASTLE DISEASE IN POULTRY USING DAWADAWA SEEDS

The innovation addresses the sickness and death rate in poultry, using the seeds of the local herb Dawadawa in powdered form. The powder is put in the drinking water of the fowls and effectively reduces sickness in mortality of animals. Before the farmer treated his animals with the new medicine, he would experience substantial losses due to the disease. The seeds are either collected in nature or bought in the market. Processing the seeds into powder requires some patience and time from the farmer. Also, he developed a construction to keep his goats and sheep away from the water so that only fowls would have access to the medicinal water.



How does it work?

The Dawadawa seeds are boiled for a short time and pounded in order to remove their hard cover. After winnowing and washing, the seeds are boiled again until well done. After that they are put in a container and covered. After three days the seeds are dried very well and pounded into a powder. This powder should be stored in a safe container and added to the drinking water of the sick fowls. For treatment, two to three spoonfuls of the Dawadawa powder are sufficient. The water for treatment should be changed every day. Also the farmer should make sure that no other livestock drinks from the water apart from the sick fowls.



The Innovator



ABDUL RAMANI ABIELI

The second-time winner Abdul Ramani Abieli (35) is a farmer from Pusiga in Upper East Ghana. In both Farmer Innovation Contests of 2012 and 2013 he presented a winning innovation. His idea of treating worm infections in guinea fowl was awarded in 2013.

Winning Innovation

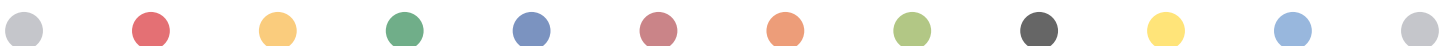
TREATMENT OF WORM INFECTION IN GUINEA FOWLS

Using the local 'Gberige' and the bark of Mahogany, this innovation decreases death rates in Guinea fowls by treating worm infestations. Until he discovered this method, Mr. Abbieli had experimented with many different ways of treating his sick fowls.



How does it work?

Gberige and Mahogany are obtained from the market or bush - in dried or wet form. A piece of both ingredients is cut and mixed with water. The mixture is then given to the fowls to drink. If the fowls are grown do not let them out early in the morning, but wait till 9 or 10 am. If they are young ones (that is day old chicks), do not give them water for two days. Then on the third day you give them the medicine to drink. This is repeated for two weeks.



The Innovator



HATIA FATI ZANGINA

Hatia Fati Zangina (65) is a passionate farmer from the Pusiga district in Ghana. In her semi-urban compound she raises poultry. She invented the pox treatment in 2003 and more than ten people had adopted her innovation by the time of the contest. Her idea was an award winning innovation in the 2013 Farmer Innovation Contest.

Winning Innovation

TREATMENT OF POX IN HUMANS AND POULTRY

The innovation treats pox in poultry and humans by using the natural ingredient 'Henna'. According to Mrs. Zangina, farmers are now able to eradicate fowl pox easily even if without any veterinary service. The method is effective and safe.



How does it work?

For the preparation of the henna paste, dried henna leafs are pounded into powder. The powder is then mixed with water to form a paste. The mixture is allowed to stay overnight and is ready for use. The paste may also be purchased in the market. For the treatment of fowls, the henna powder (paste) is applied onto the sore. Allow the fowl to take some quantity of the solution. Continue this for some time until the pox is cured. Treatment in chicken pox (human): Apply the paste to all the affected areas/parts of the patient's body. Use the solution in bathing the patient three times daily. Repeat this until the pox dry up and disappear. Note: Store the mixture in a clean container to avoid any contamination.



The Innovator

BUKARI HASSAM

Bukari Hassam (47) from Garu-Tempene in Ghana developed a technique that protects young tree seedlings from termite attack in 2003. The effectiveness of his method also convinced other farmers who now apply it with astonishing results. His idea was one of the award winning innovations in the 2013 Farmer Innovation Contest.



Winning Innovation

BIOLOGICAL CONTROL OF TERMITES

When tree seedlings are planted, they are easily attacked by termites. This innovation has a twofold positive impact. First, it prevents the destruction of roots by termites in young tree seedlings and second, it improves the soil structure surrounding the trees. The idea of the innovation is the luring of tiger ants that feed on termites. Also, their burrowing activities loosen and thereby improve the soil structure. About 70% of the seedlings survived when the innovation was applied – significantly more than without the termite control.

How does it work?

In order to attract and lure the tiger ants, bones are used and placed around the roots of the plants. As tiger ants are carnivores by nature, they will feed on the bones and, more importantly, on the termites, preventing them from damaging the roots of the young tree seedlings.



The Innovator



DABOBIL NDAAN

The young farmer Dabobil Ndaan (29) from Kongo/Mangodi in Nabdham district, Ghana was awarded for his storage innovation in the Farmer Innovation Contest in 2013. He is a crop farmer producing maize, millet, sorghum and groundnut. With the help of his innovative treatment of stored produce, post-harvest losses through termite attacks could be heavily reduced. The farmer reports that 250 other farmers have adopted this method of protecting stored crops from insects.

Winning Innovation

STORAGE CROP PROTECTION USING BABOKUKA PLANT

The farmer's innovation deals with the problem of post-harvest loss during storage through termites. He uses a local plant called Babokuka to keep insects away from stored crops. After developing and applying his innovative approach to his stored produce termite attacks decreased, and quality and quantity of stored crops increased. The innovation is not cost intensive, however time is needed to collect and process the plants.



How does it work?

For the preparation of powder, the Babokuka plant is collected from the wild, pounded in fresh state and dried. The dried plant is pounded again and ground into a fine powder. The powder is packaged in polythene bags or waterproof containers. While applying the powder, it is advised to wear protective gloves or polythene for protection. Covering mouth and nose is also helpful. The storage room should be clean. The fine powder is sprinkled against the room walls and on the floor. Additionally, it is sprinkled on top of and between the bags with the stored produce. The room should be closed properly. Keeping the powder out of reach of children is important, since the powder is bitter and leads to a burning sensation. The powder should be stored avoiding contact with moisture.





Farmer Innovation Contest

2014

The Innovator

REV. FR. A. DOMINIC

Rev. Fr. A. Dominic (44) from Zawse in Binduri District is one of the winners of the WASCAL Farmer Innovation Contest in 2014. In 2012, he found an innovative way of treating foot and mouth disease in his cattle using a local fruit plant. With the help of this treatment, sickness in his cattle could be reduced. Another 10 farmers have already adopted his innovation.



Winning Innovation

PATENG FRUITS TREATMENT FOR FOOT AND MOUTH DISEASE

Foot and mouth disease in cattle can be treated with the farmer's innovative way of using a local fruit plant called Pateng. With the help of his innovation mortality of cattle due to the disease could be decreased significantly. For the innovation, farmers have to buy the fruit plant.



How does it work?

The Pateng fruits are ground and soaked in water for three hours. This water is given to the animals for treatment. The affected animals have to be fed with a full bottle of the medicinal water twice a day. The farmer reports that making the cattle drink can be challenging.



The Innovator

ABOLIGA ASONGI

Mr. Asongi is a dedicated 72 year old farmer from Binduri District in Upper East Ghana. His animal husbandry innovation was award winning in the 2014 WASCAL Farmer Innovation Contest. He developed a method of treating bloated stomachs in his animals by using a plant called Wabzal back in 1994. Since then, other farmers have successfully adopted the practice.



Winning Innovation



CURING BLOATED STOMACHS OF ANIMALS USING THE WABZAL PLANT

This innovation addresses the problem of bloated stomachs in animals. Mr. Asongi first treated humans with the plant and later expanded the treatment to his animals. The medicinal plant is not easy to get, says the innovator, but in his case it grows in the neighbourhood and can be collected without charge. Processing the medicine takes time, but other than that there are no other costs involved. According to Mr. Asongi, the survival rate of his animals was raised from 20% to 80-90% because of the new medicine.

How does it work?

A branch of the Wabzal plant is cut and then pounded. The pounded branch is soaked in a clean container with clean water. The animals suffering from bloated stomachs should drink from it for three days.



The Innovator



HAWA AMADU

Hawa Amadu (42) is an enthusiastic animal husbandry farmer from Bawku Municipal District, Upper East Ghana. She produces a drug with Naanuba for curing her fowls suffering from digestive problems. In 1996, she developed this method, which has become fully functional since 1999. Since then, her innovation has been adopted by 30 other farmers. For her innovation, Mrs. Hamadu was awarded in the WASCAL Farmer Innovation Contest 2014.

Winning Innovation

NAANUBA EXTRACTS FOR TREATING WHITISH DROPPINGS OF FOWLS AND GUINEA FOWLS

Mrs. Amadu developed the drug to treat whitish droppings of her fowls and guinea fowls. She uses the bark of the Naanuba tree to process. She observed higher levels of survival among the animals and lower levels of infestation after administering the drug. According to Mrs. Hamadu, no costs other than time and patience occur for preparing the medicine.

How does it work?

The bark of the Naanuba tree is collected and soaked in water for about 20 minutes to obtain the extract. The medicinal water is served in a beer bottle to the fowls (10 per day). The treatment continues for a period of seven to ten days. The extract should be stored in a clean container. It can be stored for five days.



The Innovator



AZURE YAW

The 35-year old animal husbandry farmer Azure Yaw developed a method in 2011 to treat anemia in piglets. He lives in Bongo District, Upper East Ghana. As of 2014, five farmers have already adopted his innovation. His innovation was one of the award-winning submissions of the WASCAL Farmer Innovation Contest in 2014.

Winning Innovation

USING SEREGA TO TREAT ANEMIA IN PIGLETS

Mr. Yaw reports that his piglets are cured after the treatment from anemia. He observes a reduction in mortality of 75%. To produce the medicine, the Serega plant is needed. However, the plant is scarce and it takes time and patience to collect and process it.

How does it work?

The bark of a tree locally called „Serega“ is collected and boiled together with the roots of another plant called Karagongo. Let the two plants boil together for an hour, finally about 25 grams of salt is added. The drug is given to a piglet twice a day for seven days.



The Innovator

SEBALAT PUBURIG

Sebalat Puburig (67) is an animal husbandry farmer from Nangodi, in Nabdam District. He developed an immune system booster for his animals in 2007. Since then, more than ten farmers have adopted this practice. He received an award in the WASCAL Farmer Innovation Contest in 2014.



Winning Innovation

IMMUNE SYSTEM BOOSTER

Mr. Puburig's innovation addresses the problem of low immune system functions in newborn calves. With the help of this drug, he was able to raise his calves to strong and healthy animals. He uses the Jatropha plant for the medicinal application. The farmer reports that the innovation is free of costs except for the plant ingredients and water.

How does it work?

The bark of the Jatropha tree is peeled from the stem and placed in water. It is ground inside the container with water. Allow to stand for some time and give it then to the calves to drink.



The Innovator

SEETA HAMIDU

Seeta Hamidu (41) from Garu Tempane in Garu District is a dedicated crop farmer. In 2014, he won an award in the 2014 WASCAL Farmer Innovation Contest for his innovation addressing problems with onion farming. Since the development of this technique in 2003, over 80 farmers have adopted it.



Winning Innovation

ONION SEEDS AND SEEDLINGS RESISTANT TO EXCESSIVE RAINFALL AND DISEASE



With the innovation, farmers are able to produce food onion seeds and seedlings that can withstand excessive rainfall and diseases. Ordinary onion seeds and seedlings easily die from excessive rainfall and diseases such as leaf curl. For him it is now possible to grow onions in the rainy season successfully for higher incomes without facing difficulties from excessive rains and diseases. However, the testing of the chemical fertiliser with poultry droppings took the farmer three years before being successful. The cost of buying poultry dropping, groundnut vines and chemical fertilisers, water cans and so on amounted to around 300 GHS in 2005, and the cost of applying the innovation amounted to 150 GHS in 2006.

How does it work?

The origin seeds are normally nursed from bulbs. When these seedlings are about to form bulbs, they are uprooted, part of the leaves trimmed off and replanted, using only poultry droppings as fertiliser. Chemical fertiliser was tested by the farmer and was found to be susceptible to diseases and excessive rainfall, so only poultry droppings are used to produce those seeds. Only groundnut vines are used as a mulch, since they easily decompose to add more nutrients into the soil. These nutrients are needed by the onion plants to produce good seeds. After tasseling or heading, the watering is reduced to evenings only. The farmer harvests the seeds when they are mature but not overmature since overmaturation will make the seeds crack, resulting in irregular germination.



The Innovator

AKOLOGO ANYAGRI

Akologo Anyagri (53) is a crop farmer from Garu Tempane District. His crop management innovation was one of the award winning innovations submitted to the WASCAL Farmer Innovation Contest in 2014. He developed this method in 2011. In 2014, ten other farmers had adopted the innovative practice.



Winning Innovation

USE OF SHEA BUTTER WASTE TO CONTROL SWEET POTATO ROOT TUBER BORER ATTACKS

By using the waste of the local shea butter production, Mr. Anyagri prevents boring insects from damaging the root tubers of his sweet potatoes. At harvest time, there are no signs of diseases or insect attacks. According to the farmer, developing and applying this innovation has helped to decrease harvest and post-harvest losses which has a positive effect on his income. Apart from collecting and transporting the shea butter waste, the innovator does not report any obstacles in applying the innovation.

**How does it work?**

Shea butter waste is collected and spread onto the ridges before planting the sweet potato. This is done by demarcating the ridges and sprinkling the waste onto the demarcated land before rising the beds. This prevents the insects from boring in the root tubers of the sweet potato.



The Innovator



MALLAM ANAS WECHU

31-year old Mallam Anas Wechu is a committed crop farmer from Navio, Upper East Ghana. His crop management innovation dealing with Striga weed control won an award in the 2014 WASCAL Farmer Innovation Contest. He developed the weed control technique in 2010. In 2014, already 50 more farmers had adopted this technique.

Winning Innovation

STRIGA CONTROL USING NEEM SEED POWDER

Mr. Wechu discovered that the application of dried Neem seeds onto his Striga infested fields helped to reduce the weed. The dried Neem seeds are highly bitter and can burn the germinating Striga roots. Through the gradual licking of the liquid, the parasites or ungerminated seeds are burnt. According to the farmer, not all fields could be cultivated due to the high Striga infestation. After applying the new method, all affected lands have become productive and fertile for use. However, Mr. Wechu reports that the technique is labour intensive because of the planting.

How does it work?

The dried Neem seeds are picked and pounded into a powder. About 5-6 grams of the powder is fetched and put into a 6 cm deep hole by the side of the plant. It is covered with soil. The farmer reports that the smell and bitterness of the powder burns all the Striga roots and seeds in the surrounding area protecting his crops from the weeds.



The Innovator



YERBAAR FRANCIS SAGBO

Yerbaar Francis Sagbo (25) is a dedicated and highly innovative young poultry farmer from Bolgatana, Upper East Ghana. Apart from being one of the winners in the 2014 WASCAL Farmer Innovation Contest, he was 3rd in a national contest in 2012 with his self-built incubators. He has been producing electronic incubators for farmers since 2012.

Winning Innovation

SOLAR-POWERED ELECTRONIC POULTRY INCUBATOR

The device Mr. Sagbo built is an electronic poultry incubator that has solar powering capability as a back-up. The semi-automatic device, which has automatic temperature and humidity controls but manual turning mechanism can be used for 200 eggs. It combines the solar powering mechanism with the incubator, making it a one-unit solution instead of having a separate solar and incubating system. Mr. Sagbo's aim is to further develop the technology to be able to build the incubators at reasonable costs. He believes that they can have a high impact on the farmers' activities, by enabling rural farmers to hatch eggs on a large scale and expand their businesses, even without access to electricity. Mr. Sagbo reports that acquiring the materials was a problem since they were hard to find or did not have the required quality or specifications. Also, the needed parts are often expensive, so high capital investments are needed. Another challenge was to make the solar system compact enough to fit onto the incubator without making it overly bulky. Additionally, ensuring that the solar system can actually power the incubator sufficiently over a lengthy period (at least 8 hours for nights or power outage) was challenging. Technology developing cost for the solar powering system were for a) raw materials: 100 GHC, b) components (premanufactured): 1000 GHC, and c) labour: 100 GHC. For applying the technology, i.e. the incubator and installation, the farmer spent for d) raw materials: 150 GHC, e) components (premanufactured) 400GHC, and f) installation 100 GHC.

How does it work?

By using solar power the electronic incubator can be used by rural communities that have no access to the national electric grid. It is semi-automatic meaning that the automatic features like temperature and humidity control are powered and controlled electronically, but the egg-turning is manual to reduce power consumption and increase the running time of the solar battery. Mr. Sagbo designed the incubator form factor, the solar powering system and how the solar system would integrate with the incubator. The design requires that the majority of the solar components are fully integrated into the body (form factor) of the incubator to allow for easy mobility and reduce clutter of devices (especially where farmers are not technically savvy). Mr. Sagbo tested the incubator to make sure it was able to properly hatch the eggs. Three sets of eggs were hatched to ensure the efficiency of the machine was up to standard (80% efficiency was detected).





Farmer Innovation Contest

2015

The Innovator

AKOLOGO ALALE AZUMA

Akologo Alale Azuma (33) from Bazua in Binduri District is a dedicated livestock farmer who has developed several animal husbandry innovations. One of these innovative practices has won an award in the 2015 WASCAL Farmer Innovation Contest. By using *Jatropha* seeds he prevents blindness in his animals. Several farmers have already adopted the innovation since Mr. Azuma developed the method in 2013.



Winning Innovation

PREVENTION OF CATTLE BLINDNESS BY USING JATROPHA SEEDS

The method is low in costs. Mr. Azuma reports that by applying using *Jatropha* seeds as medicine for his cattle, he has to spend less money on treatment or veterinary drugs (before about 120 GHC every month).

How does it work?

Jatropha seeds are collected and dried. Then, they are burnt and put in a place where smoke can be used as an insect repellent. The black ash is used to rub the eyes of the cattle and wash them with the solution.



The Innovator



ALAGBONO ADAGKUO

Alagbono Adagkuo (37) from Sumbrungu West in Bolga District, Upper East Ghana is an innovative farmer who developed a method to treat hair loss (alopecia) among his animals. His innovation won the second place in the 2015 WASCAL Farmer Innovation Contest. Since 2011, at least five farmers have adopted his innovation.

Winning Innovation

TREATMENT FOR ALOPECIA WITH HONEY

The innovator found a treatment for hair loss in his livestock by using honey. Mr. Adagkuo reports that before developing this treatment there used to be a lot of animals with alopecia in his community. After developing and applying the honey treatment alopecia incidences have decreased and animals in the community are healthier. Affected animals occur only among those farmers who cannot afford the honey.

How does it work?

In a first step, the animals suffering from alopecia are identified. The affected areas are cleaned with a dry cloth. Honey is applied on the affected spots and massaged into the skin. The animal will feel a slight pain for at least 30 minutes. The disease usually disappears in a week's time.



The Innovator

JOHN ABIIKA



John Abiika (42) is a dedicated livestock farmer from Sandema in Builsa North District. His innovation about treating wounds and sores in his animals was one of the award winning innovative submissions to the WASCAL Farmer Innovation Contest 2015. He developed this method in 2002 and it has been fully functional and constantly applied since 2005.

Winning Innovation

THE USAGE OF NINAM TREE BARK TO TREAT LARGE WOUNDS AND SORES OF ANIMALS

Before developing this treatment, his animals would occasionally suffer from large wounds that were difficult to treat. By applying the medicinal bark of the Ninam tree wounds heal faster and completely. Mr. Abiika reports that it is challenging to apply the medicine on large and strong animals like bullocks. Also, the application takes time because the wounds are large.



How does it work?



The bark of the Ninam tree is collected and some small amount of it is boiled. The rest of the bark is left in the sun to dry. The bark has to be boiled until colour changes to red, then it has to be removed from the fire and left to cool for some time. The mouth of the big wound can now be cleaned by using a cloth rinsed in the solution of Nnam bark. The dried Ninam bark has to be grinded into powder and applied onto the wound. This treatment should be continued for five days and the wound heals completely.



The Innovator



ASANPAN ALPHA

Asanpan Alpha (30) from Gbedema in Builsa North District is a committed livestock farmer who submitted one of the award winning innovations in the 2015 WASCAL Farmer Innovation Contest. He developed a treatment for Newcastle disease in poultry in 2010. As of 2015, a couple of farmers have already adopted his innovative practice.



Winning Innovation

USING LOCAL PLANTS TO TREAT NEWCASTLE DISEASE IN POULTRY

Mr. Alpha developed a treatment for Newcastle disease in poultry using the root of the local plants Pikong, Mahogany and Koonamunig (or Koonakuunig). By letting the animals drink from water soaked with the plants, he could substantially decrease mortality in his animals. Before using the practice, the survival rate of fowls was very low. The farmer reports that about 60% of his fowls died. After developing and applying the innovation, the survival rate of the fowls could be raised. Now, about 80-95% of his animals survive. He also developed a method to protect his small ruminants from ectoparasites.

How does it work?

Treatment of Newcastle for Poultry: The root of the Pikong, Mahogany and Koonamuni are cut from the wild and soaked in water for three days. After three days the colour of the water will change showing that the active ingredients have been released into the water. The birds are not fed for a day to enable them to drink the water. This is necessary since the roots make the water very bitter. The water is then given to the birds for a week. This should be done during the early stage of the birds as chicks. The process is repeated until the birds are healthy or grown enough.

Treatment for Sheep and Goat: The waste water from the preparation of shea butter is used to treat „mange“ and ticks (ectoparasites). The waste water from the shea butter preparation can be used to treat fur removing disorder called mange. The waste water is smeared on the affected part of the sheep or goat or the whole body of the animal. After some few days new fur will begin to grow on the body of the animals and all ectoparasites will be removed from its body.



The Innovator

HARUNA ABANGA



Haruna Abanga (47), one of the innovators presented with an award in the WASCAL Farmer Innovation Contest in 2015, is a committed farmer from Zuabulga/Dabia in Pusiga District. He developed the innovative practice to treat sick guinea fowls with the leaves of a local plant in 2009.

Winning Innovation

TREATING GUINEA FOWL DISEASES USING YIILIG LEAVES

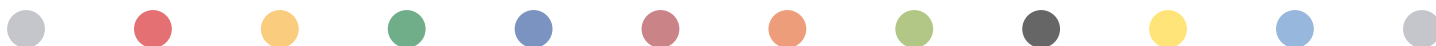


Mr. Abanga developed a way of treating his young guinea fowls with a local plant called Yiilig to protect them from premature death. Before using this method, the farmer successfully raised about 50 to 100 guinea fowls, after developing the treatment he raises about 300 to 500 guinea fowls per year on his farm.



How does it work?

The yiilig leaves are collected from the wild. They are boiled and the boiled water is left to cool. The cold liquid is poured into a clean container. This water is given to the newly hatched guinea fowls to drink for three days before you give them ordinary water. The treatment is repeated after seven days for another three days. Mr. Abanga reports that the medicine is not harmful to human health.



The Innovator



LADI HANNAH BUKARI

Ladi Hannah Bukari (41) from Nangodi in Nabdam District is an innovative livestock farmer who has won an award in the 2015 WASCAL Farmer Innovation Contest for her innovation dealing with reducing mortality in poultry. She developed this practice in 2014 and several farmers have already adopted it since.

Winning Innovation

USING NEEM SEEDS RESIDUE TO REDUCE POULTRY (GUINEA FOWL) MORTALITY RATE

Mrs. Bukari developed a method to reduce the mortality of her guinea fowls by using Neem seed residue mixing it with the livestock's feed. Before using the medicinal seeds, Mrs. Bukari experienced high mortality rate in her guinea fowl. After developing the treatment, the mortality could be reduced remarkably. She reports certain challenges in using the practice. It can be difficult to collect and process the seeds. There is a pungent smell during neem oil extraction. It takes time and labour to collect the Neem seeds. Other than that, the innovation is of low costs.

How does it work?

Collect the Neem seed and soak it to soften the pulp. Wash to obtain the seed and dry it. The seeds are ground slightly with a stone to remove the seed coat. After winnowing to remove the chaff the seeds are pounded with mortar and pestle. Little water is added. The oil appears after mashing. Now decant the oil, and the residue will be available for use. Mix the residue with feed for guinea fowl, allow the guinea fowl to peck before eating, this will reduce mortality rate.



HAMIDU SEIDU

Hamidu Seidu (38) from Bawku Municipality is an enthusiastic livestock farmer. His innovation of using a local plant to treat skin leaching in his cattle was one of the award winning applications in the WASCAL Farmer Innovation Contest in 2015. He developed this treatment in 2000 and since then, more than 25 farmers have adopted it.



Winning Innovation

BONTO PLANT USED IN TREATING SKIN LEACHING IN CATTLE

His innovation addresses the problem of skin leaching in cattle. By applying ground Bonto leaves on the affected animals, Mr. Seidu was able to reduce the infection rate in his cattle. Before, he observed high levels of infection in cattle, but after developing this new treatment only low infection rates were observed. The farmer reports that apart from labour and time to collect and process the Bonto leaves, the method is low in costs.

How does it work?

First, fresh Bonto leaves are collected and ground. Then the ground Bonto is applied on the affected cattle with skin leaching within a four-day interval. This treatment is continued until the condition changes.



The Innovator



PWAMEBAM K. FRANK

Pwamebam K. Frank (38) from Kayoro Area in Upper East Ghana was one of the winners in the 2015 WASCAL Farmer Innovation Contest. His crop management innovation dealing with the difficulties of sesame cultivation was developed in 2013 and has already been adopted by 30 other farmers.

Winning Innovation

SESAME SEED PLANTING WITH “NYANSANGA KONKOLO”

The innovation addresses the problem of broadcasting sesame and eliminating the laborious nature of sowing the crop. The sesame seeds are very tiny which makes it difficult to sow the required number per hole. Broadcasting also overcrowds the seeds unevenly in the field which leads to low yields. Transplanting which would have been the best is not common with the farmers in the region. The uneven nature of the rains does not favour transplanting under rain-fed agriculture. This is because after transplanting there is always the need for water to avoid seeds wilting. The Nyansanga Konkolo addresses all that and gives better yields. Before this innovation, farmers used free hand broadcasting mixing the seeds with dry sand, but germination was always uneven. Few farmers tried sowing with the dibbler which requires many hands to be able to sow and even with that getting the required plants per stand is still difficult until thinning out. As a result, cropping was very time consuming and with lower yields. After implementing the innovative practice the seeds are always evenly and uniformly germinated which reduces the intensity of labour, and results in higher output per man hours, increased yields and productivity.



How does it work?

In a first step, get the Konkole-ba, which is a local calabash with a long handle used for carrying water to the farm. Perforate one side (half side) of the Konkole-ba with a spacing between the holes (about 0.6m - 1m). During planting fill half of the Konkole-ba with the sesame seeds through its big opening which is usually for water. Take that to the prepared field and start shaking it, dropping them in rows. After that harrowing is done immediately to cover the seeds well. Seeds germination will be evenly and uniformly if not dormant.



The Innovator

AMOA AGANMOLIGA

Amoa Aganmoliga from Anafobisi in Bongo District is a committed and innovative farmer. Her innovation was one of the winning innovations in the WASCAL Farmer Innovation Contest in 2015. Ever since the development, the storage innovation has been adopted by several other farmers.



Winning Innovation

STORAGE OF BANBARA BEANS AND KENAF SEEDS USING DAWA DAWA PODS

Mrs. Aganmoliga's farm suffered from the damage of Banbara beans or Kenaf seeds during storage resulting in poor germination rates. Before developing the new practice, insect pest infestation of seeds caused the loss of seed viability and quality. Now the quality and viability of the seed is maintained ensuring good germination rates. The innovation is not expensive with only labour needed to apply it.



How does it work?

In a first step, get Dawa Dawa pods. They are boiled in an appropriate size pot till you get a brown solution. Remove the pods from the boiling water and pour it over beans or seeds. Drain off the water immediately.



The Innovator



SALIFU ABUGRI

Salifu Abugri (53) from Kugri, Songo-Senebaga in Garu Tempene District is a driven crop farmer who developed a method in 2010 to protect his onion plants from diseases. This innovation won an award in the 2015 WASCAL Farmer Innovation Contest and has been adopted by several other crop farmers already.

Winning Innovation

TRANSPLANTING ONIONS ON RIDGES

Mr. Abugri developed a practice to prevent diseases from attacking his onion plants. In addition, he was able to ensure fast growth as well as high yields. By transplanting onions on ridges during the raining season and applying organic manure on the stand of the plants he managed to increase the performance of his crops substantially. His crops are now disease-free and very productive. All resources needed are found or produced locally.

How does it work?

Clear the land by weeding the whole area. Collect all the weeds out on the field. Use bullocks to create ridges or create the ridges manually. Dig holes on the ridges where the plants are going to be transplanted. Put organic manure on all the holes and cover with soil. Water the place for about a week. Transplant onions on the holes with the manure. Within two months, the onions are ready for harvesting without any disease infestation.



The Innovator

ALI NAGBAM

From Basyonde, Kongo Area in Garu Tempane, Ali Nagbam (32) is a young and active poultry farmer. His innovation dealing with egg hatching won an award in the 2015 Famer Innovation Contest. By applying his innovation he was able to increase the amount of hatched chickens in his farm.



Winning Innovation

DOUBLE EGGS HATCHING INNOVATION

His innovation solves the problem of insufficient hens for hatching. Mr. Nagbam uses one hen to hatch two sets of eggs at the same time. Before applying the innovation, the eggs were going bad because of lack of hens. After finding a way to incubate more eggs with the same amount of laying hens, many chickens and guinea keets hatch in his farm. The farmer reports that the innovation is very cost-efficient and only needs labour.

How does it work?

The hatching nest is made deep and wide enough to hold a set of eggs. The first set of eggs is placed in the nest and then covered with another nest. Then, the second set of eggs is placed on top. Now the hen can start the incubation. Every two days, the two nests are reversed so that the top one is down, and vice versa. This procedure has to be continued for 25 days before the eggs are hatched. It is helpful in circumstances where there are insufficient laying hens but you have access to fertile eggs.



The Innovator

MODESTA ABALEM

Modesta Abalem (59) from Kasena Nankana West-Paga District was one of the winners of the 2015 WASCAL Farmer Innovation Contest. Her innovation of Striga weed control was developed in 2008 and has been adopted by a handful of farmers already.

Winning Innovation

STRIGA WEED CONTROL MEASURES BY USING ANOTHER WEED



Mrs. Abalem's innovative practice addresses the problem of widely spread Striga weed on her farm. After a careful look around her farm she realised that in areas where a weed called Jamansoni was found, Striga was not present. So she decided to multiply Jamansoni as a Striga weed control measure. Before using this new crop management practice, every year Striga invaded and destroyed her farm leaving nothing for her to harvest. Since Striga control is not easy and the weed competes with the crops for nutrients, she experienced very low yields. After developing and applying the idea of weed control with another weed her farm is Striga-free and productive. Since Jamansoni also serves as a vegetable for cooking the risk is very low.



How does it work?

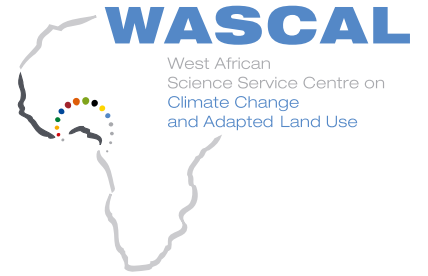
The first step is to harvest a lot of Jamansoni seeds. They are dried and kept in a safe place. When the first rains come for the following farming season, spread the seeds evenly round the whole farm before ploughing. Before sowing the crops, the Jamansoni weed has already appeared round the farm and prevents the spread of Striga.





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