

Native Swine Production Feed with Kitchen Leftover and Madre De Aqua (*Trichantera gigantea*)

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ABSTRACT— In response to the problem of poverty and health issues of children in San Jorge, in partnership with the Department of Agriculture-Local Government Unit, San Jorge, Samar and Regional office 8, project on native swine raising feed with kitchen leftovers and madre de agua (*Trichantera gigantea*) was implemented. The project was piloted in Barangay Blanca Aurora, San Jorge Samar as among the community who are experiencing such issues. Training on swine production care and management was conducted to ensure that proper rearing and management of the swine was undertaken. Pig pens were constructed for safety and protection of the pigs. Administration of vitamins and deworming was provided to ensure survival and development of the pigs. Madre de agua cuttings were provided to 11 beneficiaries and planted it in their respective land area. Beneficiaries were glad for the technical assistance of Department of Agriculture through the training provided since it has provided additional knowledge in swine production and proper management. Marginalized farmers trained on Values Formation, were empowered and increased sense of dignity and worth and productively contributing to family enrichment and community development. Farmers have increased income up to 40% of the participating household beneficiaries after a year from the sales of their piglets. Native pigs feed with madre de aqua and kitchen leftover have a significant response of growth and piglet's production.

KEYWORDS: kitchen leftover, native swine, madre de aqua, San Jorge

1. INTRODUCTION

The Philippine pig industry is traditionally a backyard dominated operation. Despite the presence of large-scale swine farms in some areas of the country, backyard hog raising still predominates in the rural areas. It is one of the livestock enterprises that adds to the meager income of every marginal farmer. Swine raiser preferred to raise piglets. After weaning, they fed it until it reaches 85 kg. to 90 kg. of slaughter weight so that it can be sold for meat, old during traditional occasions like fiestas and other special events in their family [4]. Backyard pig raising is a common economic activity among households in the rural barangays of Batangas province. Results reveal that involvement of the sampled owners in backyard pig raising are greatly influenced by their demographic characteristics. It was found that majority of the backyard pig owners' age are above 30 which, according to the employment customs in the Philippines, are already above the ideal age to start a professional career either in the government or private institutions. This phenomenon, coupled by the backyard pig raisers' low educational background, makes it really hard for them to qualify for jobs in formal sectors, which can potentially offer them higher income sources [13]. During the 1970's and 1980's households raised swine fed with root crops and kitchen leftovers. Swine raising became the mode of family savings for the education of their children and for special occasions. In the past, the expenses in swine raising does not affect the family income. In the late 90's up to the present, families raised swine using improved breed that are dependent on commercial feeds and needed biologics as prescribed to attain the desired growth and weight of swine to be marketable. The lack of sufficient know how with regards to financial aspect of the families engaged in swine production caused financial limitations in the family. Swine production that utilizes commercial rations incurs high cost that affects household budget for basic needs. Swine raising demands

high production cost without alternative source of commercial feeds. Pig raising itself is an economically viable livelihood among backyard pig raisers by meeting their household expenses in a considerable period of time. The cooperative empowers its member-raisers to gain more income, thus giving them opportunities to have a considerable amount of savings on a regular basis and to have a stronger purchasing power in meeting their household basic needs like food, clothing, education, hospitalization and other utility services. The opportunities for greater income, purchasing power, and savings that a cooperative offers its members reinforce its importance in improving the backyard pig industry in general and the smallholders' socioeconomic status in particular [14].

Moreover, specialization of piglets will facilitate the process of structural evolution of hog farms. Hog production could be divided into four phases of breeding and gestation, farrowing, nursery, and finishing. Specialized feeder hog-to-finish operations became increasingly common, contracting may raise farm productivity by improving the quality of managerial inputs, by speeding the transfer of technical information to growers, thereby permitting the adoption of more efficient technologies [11]. There is evidence that farms that include pasture for grazing typically have reduced feeding costs. Such production systems can also be more environmentally sustainable as the input (pasture) is inedible to humans, compared to conventional indoor systems, which use human-edible feeds (e.g., soya). However, some wild boar farms have performed poorly compared to those rearing other swine such as hybrid wild boar and domestic pigs [18]. The municipality of San Jorge is comprised of 41 upland communities whose main sources of income were farming and livestock raising. This is their means of sustaining the family's basic needs. Most of the pig raisers had a capital of more than 500,000 and maintained consultancy services with farms visited twice a month. For the majority of pig or hog farmers, the high costs of inputs, particularly in feeds considered as one of the significant problems [7]. In terms of nutritional status of children, the Barangay Health Worker of Barangay Blanca Aurora revealed that 10 children are below normal, 21 children with improved health and 3 have moved out as of October 2016. The data signifies that almost 30% of the children below seven (7) years old need to improve their nutritional status. Household size is a proxy for family labor available to work on the farm. Household size is expected to have a positive influence on efficiency indices because family labor is believed to be more motivated than hired labor. A negative relationship may indicate underutilization of labor in the household or less attractive off-farm labor wages that might contribute towards the use of excess labor on the farm. Producers do not make use of the best available technology and that household resources are either 'too small' or 'too large'. On average, producers could reduce their farm inputs by 60 percent and still achieve the current level of output, [15]. Increase in farmer wealth motivates them to transition away from backyard hog production. However, the relationship between wealth and herd size among large-scale hog producers is positive. With farmer wealth increasing rapidly, hog production toward the large-scale mode is expected to continue [17].

There are studies that shows that raising native swine utilizing local feedstuff can be economical and nutritious. Among these studies is the study of [5], according to Dr. Etis, madre de agua or *Trichantera* has been popular to be a good alternative feed for native swine. According to her, fresh young leaves fed to pigs can replace about 20-30% of its required commercial diet and can be processed as leaf meal used in mash. [5] also said that *Trichantera* leaves are good sources of protein for poultry and livestock. She also added that madre de agua is well accepted by pigs in their diets and no toxic effects on its intake. *Trichantera*, according to her has crude protein (19.26%), crude fiber (14.41%), calcium (6.19%) and phosphorous (0.25%). Moreover, the use of *Trichantera* as feedstuff is cheaper and easy to propagate thus it is sustainable. Among the mixtures of annual grasses and legumes taken into the study and which can be used in pig farming within experimental area, in a descending order, considering the obtained yields, the following variants can be recommended for farmers: triticale + peas fertilized with N120P70 kg·ha⁻¹ dose and unfertilized oat + peas

[19]. The current study of [12] confirmed a high nutritive value for mulberry leaf meal if given to growing pigs. Furthermore, the data herein presented strongly suggest the necessity of more investigation to be conducted in order to improve the possible role of trichanthera leaves as a valuable source of protein for this type of animals. Compared to trichanthera, mulberry leaf meal determined higher DM digestibility at the rectum site. The same results were observed in the crude fiber and NDF fractions of the diet. More fecal output of materials was evident in the trichanthera leaf meal-based diet, as a consequence of a low rectal digestibility of DM. The deterioration in feed conversion as caused by the introduction in the dietary formula of tree foliage was probably due to a consequence of the increased presence of the fibrous fraction in the meal. This very well known, negative effect on animal's feed conversion, since mulberry and trichanthera leaf meals contained a relatively low energy density, an increased level of raw palm oil in the diet would be necessary as a compensatory dietary ingredient [3]. The profit gap between backyard hog production and scale hog production is gradually expanding, and the economic advantages of scale hog production are obvious. Therefore, it is necessary to improve the production technology service system, develop moderately scale production, and improve the level of organization of farmers in order to promote the modernization and transformation of backyard hog production and further enhance the competitiveness, [8].

Trichanthera had the highest fibre content and mulberry the highest DM content. The total sugar was high in all three species. For Trichanthera, the reducing sugars represented roughly one-third of the total sugars whereas, for the mulberry and cocoyam leaves, it represented more than the half. The proteins of the leaves of the three species cover the requirements in essential amino acids of growing pigs and lactating sows. The only exception is the lower lysine content in Trichanthera [10]. The study of [1] showed that combination of hydroponics maize fodder and concentrate feed had no negative effect on performance and blood profile of weaned pigs. The hydroponics maize fodder inclusion in the diet of growing pigs is a welcome idea. The average DM content of hydroponic maize fodder was 25.00%. pigs in T1 and T3 had similar weight gains while feeding of hydroponics maize fodder reduced the total dry matter intake of the pigs. The study of [2] showed that feed conversion ratio increased with more rice waste incorporated into the diet and was lowest in the control which contains no rice waste. The increase in the feed conversion ratio as the level of rice waste increased showed that the animals on the test ingredient had almost a similar feed intake with those on the control diet but gained less weight. It was observed a high feed intake due to relatively low energy levels in food waste mixture. However, there was a decrease in feed efficiency as the level of food waste mixture incorporated into the diet increased. Study of [16] stated that replacing soybean meal with legume leaf meal feeds for pigs had no effect on eye muscle thickness and back fat. Increasing replacement of soybean protein with legume leaf meal protein resulted in a linear decrease in slaughter weight, hot carcass weight, back fat in carcass and abdominal fat, while lean meat content was unaffected. In the study of [6] on the knowledge, attitudes and practices relating to antibiotic use and antibiotic resistance among backyard pig farmers, participants were asked to suggest two pig diseases that are normally treated with antibiotics. Thirty percent of participants (80/271) gave answers, and most of these (75 %, 60/80) included diarrhoea. The second most common answer was respiratory tract infection diseases (29 %, 23/80) such as cough and running nose. Other answers included foot and mouth disease (FMD) (19 %, 15/80), inflammation (4 %, 3/80), stopping eating (3 %, 2/80), bacterial infections (3 %, 2/80), parasites (1 %, 1/80) and pneumonia (1 %, 1/80). The target recipient of this technology transfer is Barangay Blanca Aurora which is one poorest barangays of San Jorge. This project will cater 11 farmers who will be trained on values formation, growing of madre de agua and other root crops and management and production of swine. Families will be receiving a startup livelihood package, for them to have the actual practice and alternative livelihood after the trainings. After the series of trainings, the beneficiaries will have to show their interest in starting their livelihood project by sharing their counterpart like establishment of swine shed and pig pen, area to be planted with madre de agua and strict attendance during the series of trainings conducted by the University and the implementation policies of the project. First

week implementation of the project families will undergo values formation trainings, forage plantation, animal care and management.

2. METHODOLOGY

The project team have conducted a rapid assessment in Blanca Aurora village those farmer families which do not have history of negligence of project implementation provided by any funding agency (microfinance, livelihood project etc.), have a previous experienced swine raising, farmers have planted madre de aqua and other root crops as feed for native swine. The beneficiaries have given training on forage planting and swine care and management. After the swine care and management training, piglets were distributed to the 11 household beneficiaries. Afterwards, cuttings of madre de agua planting materials was also distributed. In collaboration with the Department of Agriculture (DA)-Local Government Unit of San Jorge and Regional office 8, and Northwest Samar State University (NwSSU) monitoring and evaluation of the project was conducted regularly. In support with the collaboration, a tripartite Memorandum of Agreement between family beneficiaries, NwSSU-San Jorge Campus and DA region 8, DA-Local Government Unit of San Jorge, Samar, Philippines. The monitoring and evaluation (M&E) framework shown in Table 1 was used by the implementer to monitor and evaluate the project. Farmers were also oriented about this framework. Farmers could report their accomplishments and the success of the project based on the given baseline data and targets. The M&E framework provides a structured approach with advice on spatially explicit tools for hands-on tasks, such as cumulative project impact assessment. The practical steps to track and assess a project have been taken using proven mechanisms and approaches. [20]. [9] suggested that the adaptation-specific or -related elements of M&E systems used by policy and project collaboration agencies and programmes. In designing, collaborating projects and programmes, M&E is an important component. This method ensures that the future benefits of interventions are recognized and can lead to the production of potential interventions. On this basis, it defines the M&E characteristics for the correct adjustment and shares lessons learned on the use and use of adaptation indicators.

Using the Monitoring and Evaluation Framework the beneficiaries were evaluated their process in dairy cattle production for a stable livelihood, eventually for a sustainable income. Documented their income derived from dairy cattle production, their pasture development based on the baseline data. Monitoring and evaluation were also conducted after the farmers received pigs, biologics, and planting materials. Farmers/beneficiaries have managed their animals based on their learning from the training on cattle production which was they attended.

Table 1. Monitoring and Evaluation Framework

	Indicator	Baseline	Target	Data Source	Responsible
Goal	Increase farmers' income from swine production as an alternative livelihood	PhP 2,000 monthly income	PhP 4,000 monthly income	Computed monthly expenses and income	Project proponent and members
Outcomes	Farmers are economically secured	Fewer than 3 meals a day, malnourished children, clothing is not appropriate	Meals 3 times a day, children are well-nourished and with appropriate clothing	Actual family interviews and secondary data	Project proponent and members

Outputs	Established madre de aqua plantation	No madre de aqua plantations	Madre de aqua planted by the 11 beneficiaries	Actual farm visits and measurement of the size of farms planted with forages	Project proponent and members
	11 farmers receive swine, biologics, and madre de aqua planting materials	5 families owned swine in the villages, no madre de aqua plant	10 heads swine, biologics, and madre de aqua planting materials distributed to 11 farmers	Actual farmer visits and numbers of swine, biologics, and plant materials	Project proponent and members
	11 farmers were trained on swine production	No training on swine production & values formation	Training on values formation & swine production conducted	Actual attendance of the training attendees	Project proponent and members

The results framework shown in Figure 1 represents the strategy of the project stakeholders (e.g., farmers, implementers, and DA) to achieve specific objectives. This tool was used to help stakeholders identify and focus on the key objectives of the project. It was also used as a basis for the impact evaluation of the project. Details of the inputs, activities, outputs, outcomes, and impacts of the framework were determined and agreed upon by all stakeholders.

The results framework was designed during the project identification phase and then improved and adapted throughout the project cycle. Prior to the development of a full-fledged results framework, the problem the project intended to solve was explained. The result framework was an idea on how the project inputs could lead to the desired outcomes and the knowledge and skills required of the beneficiaries and measured the progress and results of the project. The results framework is the result of careful planning, communications, and management that seeks to emphasize the intended results of key project objectives. A good results framework is based on good analysis, standard theories in the technical sector, and the expertise of on-the-ground implementers. Such a framework would lead to the identification of performance indicators and risks that may impede the attainment of the goal.

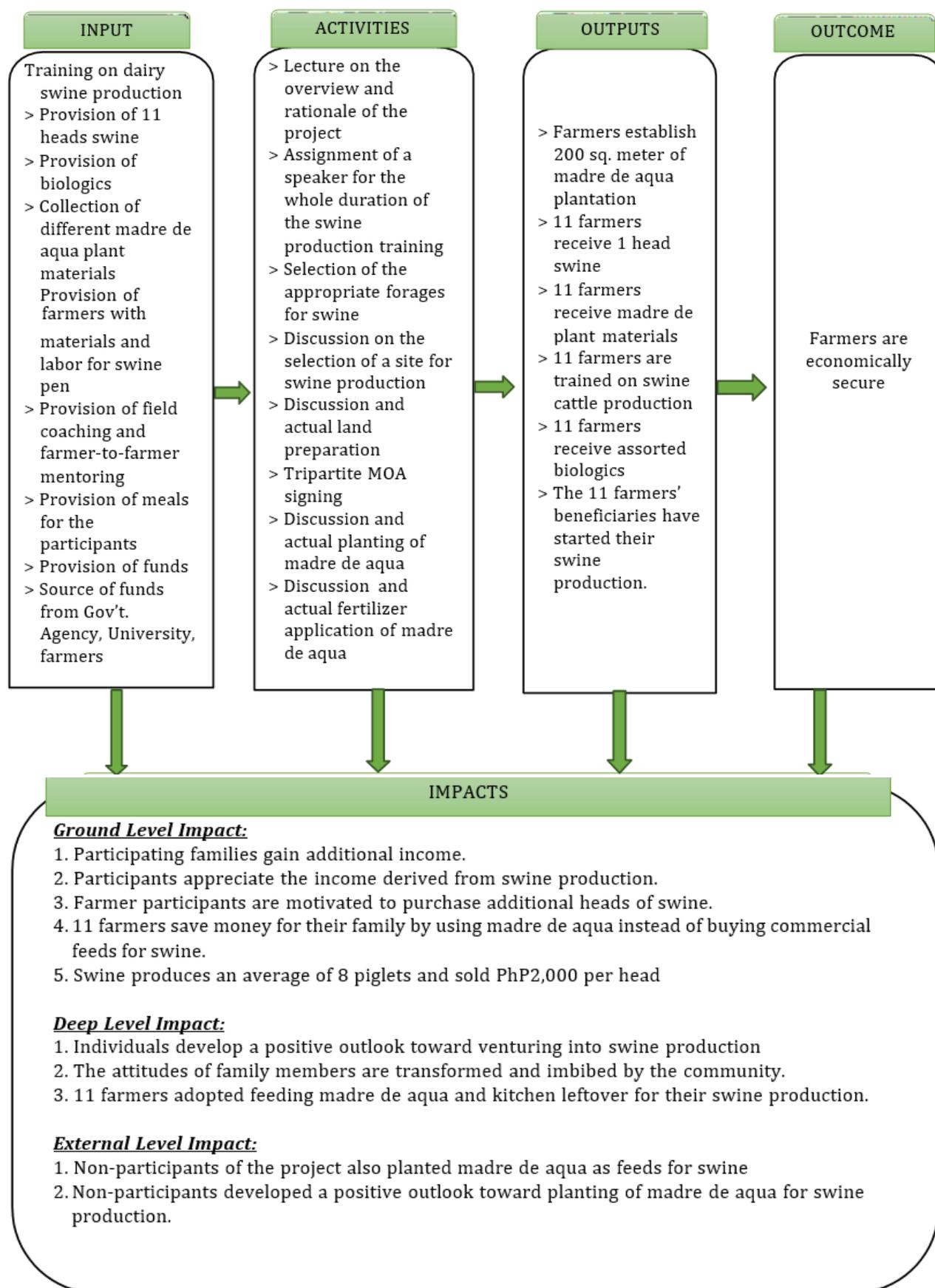


Figure 1. Result Framework

3. RESULTS

The project was implemented beyond the target start date of implementation due to budgetary limitation and budget prioritization. Social preparation activities such as the rapid assessment of the pilot community was undertaken. Screening and pre-qualification activities of the beneficiaries was conducted to ensure that marginalized community members were considered as target beneficiaries of the project. There were 11 heads swine purchased for 11 target household beneficiaries were able to benefit. Moreover, plantation of madre de agua was established in respective lots of the 11 beneficiaries who were provided with the swine. On the other hand, the swine production, care and management training were conducted. The 11 target beneficiaries participated in the training. The training was facilitated by NwSSU faculty members as well as technical personnel from the Department of Agriculture- Local Government Unit and Regional Office 8. The training was a two-day training to capacitate the beneficiaries on proper management and swine production and values formation. The participants showed their interest during the trainings. Henry Ortiz, expressed his deepest gratitude for being one of the beneficiaries and for the privilege being one of the participants. He said that “training has provided him additional know how on the proper management of swine compared to his traditional way of growing swine”.

Moreover, technical assistance was provided during monitoring period and regular visits to household beneficiaries. Monitoring visit by project leader was conducted to know the actual conditions of the swine. Administration of vitamins as well as deworming was conducted to the swine by the project leader to ensure survival of the piglets. During this time, proper sanitation was emphasized to ensure cleanliness in the swine pen as well as proper feeding of the animals were stressed by the project leader. Beneficiaries were able to realize the importance of giving, aside from having the pigs and madre de aqua planting materials, they were also formed of a good value, while care and management of the pigs and production of madre de aqua as one of the feed sources is a must. Eleven marginalized farmers trained on Values Formation, (Family Development Session, Human & Personal Relation and Leadership Training) were empowered and increased sense of dignity and worth and productively contributing to family enrichment and community development. Established 11 areas planted with madre de aqua and other root crops for swine feed; have increased income by 40% of the participating household beneficiaries after a year from the sales of their piglets.

4. CONCLUSION

The project was able to attain some of its objectives. It was able to train 11 farmers on swine production, care and management despite the budgetary limitations. Moreover, 11 farmer household beneficiaries were able to establish their plantation of madre de aqua as source of forage or feedstock for swine. 11 farmers established their madre de aqua plantation in respective to have a sustainable feedstock source aside from kitchen leftovers. The first batch of the beneficiaries were thankful for the livelihood opportunity extended to them as this will augment in meeting their basic needs in the future. Other farmers were hoping that after the first farrowing of the first batch beneficiaries they will be the next priority for the piglet dispersal. Development of source of feedstock for swine raising is avital requirement in swine production and breeding to ensure sustainability of such alternative livelihood option. The resource speakers or facilitator has critical roles in conducting capability trainings for the participants to gain and adopt knowledge and skills on the training that will be an edge in the success of the livelihood option. Native swine breeding and swine production is a better alternative livelihood option for farmer beneficiaries. This will also at the same time lessen dependency of farmer in forest resource utilization and forest degradation thus, protecting the forest resources and the environment.

5. RECOMMENDATIONS

This project on native swine raising feed with kitchen leftover and madre de aqua is a promising livelihood

option that will help in sustaining the economic condition of marginalized persons in the community. If this will be sustained, all the marginalized group in Blanca Aurora can avail the said projects and continued assistance technically will be provided to the beneficiaries. It is highly recommended that in proposing this kind of project, the total number of pilot target beneficiaries should avail the benefits as planned to avoid untoward feedbacks from the community. This would also affect the integrity of the implementing institution if the implementation is not based on what is planned. NwSSU should have proper budget prioritization to avoid giving false hopes to target beneficiaries and to retain credibility and integrity of the implementing institution.

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