



Toward Sustainable Village Enterprises: Open Innovation, Community Empowerment, and Green Digital Transformation

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Abstract

The transformation of sustainable village-based economies requires Village-Owned Enterprises (VOEs) to develop innovative business models that integrate community empowerment, open collaboration, and adaptation to green digital technologies. In this context, open innovation practices have emerged as a strategic approach to strengthening institutional capacity, enhancing community participation, and promoting economic, social, and environmental sustainability. This study aims to explore the implementation of Open Innovation (OI) in developing a sustainable community empowerment model at VOE Village, Indonesia.

This study employs a qualitative case study approach. Primary data were collected through in-depth interviews with VOE managers, local communities, and relevant stakeholders, while secondary data were obtained from documentation, institutional reports, domestic regulations, and a systematic literature review of academic articles and journals. The data were analyzed descriptively using Computer-Assisted Qualitative Data Analysis Software (CAQDAS) with NVivo 12 to enhance analytical effectiveness, accuracy, and depth of interpretation.

The findings reveal that: (1) the application of design thinking in local community development played a significant role in establishing and developing the institutional framework of VOE Niagara; (2) open innovation practices facilitated the creation of adaptive, collaborative, and sustainability-oriented village business models; and (3) the management of VOE Niagara integrated environmental, economic, social, partnership, and prosperity dimensions as the foundation for sustainable business and green digital innovation at the village level. Furthermore, the utilization of external networks, multi-stakeholder collaboration, and the development of community digital capabilities were identified as critical factors in supporting sustainable innovation. This study highlights that institutional transformation based on open innovation can serve as a strategic mechanism for strengthening inclusive, resilient, and sustainability-oriented rural economies.

Keywords: Open Innovation; Sustainable Business; Green Digital Innovation; Community Empowerment; Village-Owned Enterprises (VOEs); Sustainability.

1. Introduction

Village-Owned Enterprises (BUMDes) are instrument strategic in push development economy village through optimization potential local and empowerment society. According to Sayutri [1], the existence of BUMDes managed in a way sustainable capable dig potential village at a time support various initiative alleviation poverty. The formation and institutionalization of BUMDes is also an response to gap development between rural and urban areas. In line with that, Syukran and Tauran [2] (2016) stated that sustainability BUMDes performance contributes to improvement income public as well as creation field work at the level village.

Although thus, various study show that the role of BUMDes in increase welfare public not yet completely optimal. Ibrahim [3] found that part large BUMDes still face various constraint institutional, managerial, and innovation so that Not yet capable give impact significant economic for public village. Budiono [4] also emphasized that success BUMDes operations do not always followed by increasing perceived benefits society. Similarly, Kusuma and Purnamasari [5] revealed that there are BUMDes which are administrative assessed succeeded by the government village, however its existence not yet give contribution real to development economy local.

Findings the show that the success of BUMDes is not Enough measured from aspect operational only, but must seen from sustainability performance. Various phenomenon the demand strengthening BUMDes capacity to be able to maintain sustainability organization in term long. In perspective sustainability, performance organization is integration between dimensions economic, social and environmental aspects which are together create mark for organization and society [6].

[17] [8].

On the other hand, development technology, digitalization, and globalization has push occurrence disruption in almost all over sector life, including economy rural areas. Conditions the demand government, perpetrators business and society for capable adapt to changes that occur very quickly. Kasali [9] explains that ability adapt to innovation is the main strategy in maintain power competition organization. Government play a role in provide adaptive regulation to development technology, whereas perpetrator business sued for develop innovation to be able to survive and grow in a way sustainable.

Rural areas become one of the areas most affected by climate change said. Data from the Central Statistics Agency show that amount poor people in rural areas still more tall compared to urban areas. In March 2022, the number of Indonesia's poor population reached 26.16 million soul, consisting of over 14.34 million souls in rural areas and 11.82 million urban souls. This conditions show that problem main village is not limitations potential, but rather low capacity in manage and develop potential the become activity productive economy.

In context government policy has give more space wide for village through Constitution Number 6 of 2014 concerning Villages. Regulation the put village as entities that have autonomy in manage governance, development and economy himself [10]. One of the implementation policy the realized through the formation of BUMDes as instrument strengthening economy locally managed based on initiative public village [11]. The existence of BUMDes is expected become a driving force activity economy village at a time increase welfare public through utilization potential local optimally [12].

The success of BUMDes is not can separated from the empowerment process society . Mardikanto and Soebiato [13] explain that empowerment public is a process of increasing ability society to be able to develop potential owned in a way independent. Empowerment the covers three dimensions main, namely create conducive climate for development community (*enabling*), strengthening capacity community (*empowering*), as well as give protection to group empowered communities (*protecting*). Empowerment public become foundation main in creating an empowered BUMDes competitive and sustainable .

In addition to empowerment, the characteristics social public villages are also important capital in development of BUMDes. Public village own character strong collectivity that is reflected through culture of mutual cooperation, mutual respect, accountability government village, as well as partisanship to strengthening economy local. Social capital the is supporting foundation the formation of participatory and interest - oriented BUMDes governance public. [14]

In face dynamics an increasingly complex environment complex, approach open innovation *innovation* is becoming a relevant strategy For increase capacity organization. Chesbrough [15] explains that open innovation is an approach that utilizes source internal and external knowledge in a way simultaneous in produce innovation. Approach This emphasize that organization No Again only rely on internal capabilities, but also build collaboration with various stakeholders interest like college high, government, institution research, community, and sector private sector [16]. Lichtenthaler [17] even show that organizations that have capacity research and development still need collaboration external for increase quality its innovation.

A number of study show that utilization internal and external knowledge through open innovation capable increase capacity organization, strengthening collaboration, speed up commercialization innovation, as well as create mark sustainable growth [18] [19] [20]. Therefore that , approach open innovation viewed own potential big for strengthen capacity BUMDes institutions in face challenge globalization and disruption.

The study about implementation open innovation to BUMDes still relatively limited. Most of study previously more Lots discuss governance, institutional, or other aspects empowerment public in a way separate, whereas integration between open innovation, empowering community, and the sustainability of BUMDes is still not yet lots reviewed in a way comprehensive. In fact, collaboration with various actor external believed can strengthen the innovation process, improve quality products and services, as well as produce superiority sustainable competitiveness for BUMDes and public village. [21] [22] [23] [24] [25] [26].

Based on gap study said, this study how implementation open innovation capable push success BUMDes management at the same time strengthen empowerment sustainable society. This research use perspective open innovation from Chesbrough [15] for analyze how utilization source internal and external knowledge (*inbound* and *outbound open innovation*) can increase capacity BUMDes innovation was successful. This research expected give contribution conceptual to development theory open innovation in context institutional village at a time give recommendation practical for BUMDes management that is oriented towards sustainability economic, social, and environmental.

2. Theoretical Basis

2.1. Community Empowerment

Empowerment public is draft development that places public as subject main in the development process. This concept aim increase capacity individual and groups to be able to manage natural resources possessed, taking decision in a way independent, and participate active in increase welfare social, economic, and environmental.

Foy [27] defines empowerment public as effort increase ability society to be able to operate rights and responsibilities the answer in a way dignified. Through community empowerment get more space big ror convey aspirations as well as participate in the planning and decision-making process decisions that affect they life.

Empowerment is a development process participatory that allows individual and the previous group marginalized get more control big on life, environment and resources the power they have. Empowerment not only viewed as results development, but also as a process that strengthens capacity individual and community for reach a better life good [28].

In level individual, empowerment is ability somebody for get control on his life so that capable increase welfare himself and society. At the level of community, empowerment interpreted as a collective process that improves ability public in solve various problem as well as strengthen position social and economic compared to with condition previously [29]. Simon [30] added that the process need support capable organization facilitate public in manage life and resources its power in a way independent.

In perspective development, empowerment public based on the principle partisanship to community, participation active, and change - oriented modernization social, economic, political, and cultural. Empowerment strategy public covering three aspect main, namely: (1) partisanship to group weak society; (2) improvement participation public in the development process through delegation authority and autonomy; and (3) modernization that encourages change structure social, political, cultural and economic based participation public. [31]

Development community *development* is an approach that places public as perpetrator main development. Adi [32] explains that development public is a process that prioritizes involvement active public in every stages development, starting from identification problems, program planning, implementation activities, up to evaluation results. Through approach said, the community expected capable increase condition social and economic in a way sustainable.

In line with that, Sumodiningrat [33] views empowerment public as a social process that encourages public for design, implement and develop various activity in a way independent in fulfil need as well as finish problems faced. Alfitri [34] emphasized that empowerment is part from development an integrated economy values social so that produce a development model that is people - centered, *participatory*, sustainable, and oriented towards improvement capacity public.

Suharto [35] explains that target main empowerment is group vulnerable communities or not enough empowered. Through the empowerment process, the community expected capable fulfil need basically, accessing sources productive, increasing income, as well as participate active in the process of taking decision development. Hamid [36] added that objective end empowerment is build independent, good society in aspect economic, social, cultural, and politics.

In context development economy local, empowerment public own close relationship with development economy creative. Hasan [37] shows that sector economy creative capable become instrument important in increase welfare public through development business micro, small and medium enterprises (MSMEs), including businesses managed by BUMDes. Purnomo [38] explains that economy creative utilise natural resources based knowledge, creativity, ideas, talent, and innovation as the main capital in create mark plus economy. Therefore that, strengthening creativity and innovation public be one of prerequisite main in realize empowerment sustainable society.

According to Parsons (in Suharto, [1]), empowerment public own three dimensions main. First, empowerment is a process that begins from changes in level individual and developing become change more social broad. Second, empowerment produce change psychological in the form of increased sense of trust self, ability control self, as well as belief to capabilities. Third, empowerment realized through action social enabling group public get access to source more power, authority and opportunity fair.

Success empowerment public can measured through various dimensions. UNICEF developed five dimensions empowerment which includes *well-being*, *access*, *critical awareness*, *participation*, and *control*. Fifth dimensions the each other related and forming something strengthening system capacity public in a way sustainable.

In addition, Sumodiningrat [33] put forward five indicators. success empowerment society, namely: (1) the decline amount poor population; (2) increasing utilization natural resources local as source income society; (3) increasing concern public to effort improvement welfare group vulnerable; (4) increasing independence reflected group from productivity, capital, administration, and networking work; and (5) increasing fulfillment need basis and equality income public.

Najiati, Asmana, and Suryadiputra [39] added that success empowerment public based on four principle main, namely *equality*, *participation*, *self-sufficiency* or *independence*, and *sustainability*. Fourth principle the confirm that empowerment is a process that provides chance to public for increase capacity, strengthening trust self, as well as build a better life prosperous in a way independent and sustainable. [40]

In its implementation, Adi [32] explains that the development process public consists of on seven stages, namely: (1) stage preparation; (2) stage *assessment*; (3) stage planning alternative programs or activities; (4) stages formulation plan action; (5) stages program implementation or activities; (6) stages evaluation; and (7) stage termination. Seventh stages the is something mutual cycles related in realize empowerment effective and sustainable society.

2.2 . Open Innovation

Draft *open innovation* was introduced by Chesbrough (2003) [41] as paradigm new in management innovation that emphasizes utilization knowledge from internal and external sources external organization. Different with approach innovation closed *innovation* that relies on the entire innovation process done internally, open innovation allows organization utilize ideas, knowledge, technology and resources power from various stakeholders interest for accelerate the innovation process as well as increase mark economy through commercialization results innovation.

Approach open innovation based on assumptions that organization no again capable depends entirely on internal capacity in produce innovation. Therefore that, organiza-

tion need build collaboration with various parties, such as customers, suppliers, universities, institution research, government, community, and even competitors, for get knowledge, technology and information that can support the innovation process. The collaboration no only increase quality innovation, but also accelerate the development process product or services, reducing cost research and development, improving accuracy identification market needs, as well as strengthen power competition organization.

In a way conceptual, open innovation different with innovation closed. On the approach innovation closed, the entire process of creation, development, and commercialization innovation done in a way independent with depend on source internal organizational power. On the other hand, open innovation utilise flow knowledge from outside organization as complement source internal power so that the innovation process become more collaborative, adaptive, and responsive to dynamics environment business.

According to Chesbrough, Vanhaverbeke, and West [41], open innovation consists of on two main processes, namely *inbound open innovation* and *outbound open innovation*. Both processes describe current inflow and outflow go out utilized knowledge organization in produce mark economy through innovation.

Inbound open innovation is a process of utilization source knowledge external For strengthen ability internal organizational innovation. This process covering utilization technology, input customers, market information, collaboration with partners external, activities joint *research and development* (R&D), *R&D outsourcing*, and acquisition license or right riches intellectual from other parties. The organization get access to knowledge new that can speed up the development process innovation [42].

Mortara et al. [43] (2011) explains that implementation *inbound open innovation* done through integration various source knowledge external, such as results study scientific, market needs, *open source*, and networking collaboration with various partners strategic. Knowledge then combined with source internal organizational power for produce more innovation effective. Integration between source internal and external power allows organization maintain Power compete in the market that there is and create new market opportunities.

On the other hand, *outbound open innovation* is a process of utilization knowledge and technology owned organization for create mark through mechanism commercialization external . Chesbrough et al. [44] explain that approach This done with give access to other organizations to utilise technology or results innovation through various form work same as license technology (*licensing*), development company spin - off, alliance strategic, as well as form commercialization others. Through mechanism said, the organization can expand utilization innovations owned at a time get benefit economy from asset intellectuals who have not utilized optimally.

Mortara et al. [43] added that *outbound open innovation* allows organization expand market reach through utilization internal knowledge by partners external. This process no only increase mark economy results innovation, but also accelerate distribution technology as well as strengthen collaboration inter-organizational in create sustainable innovation.

Open innovation is approach collaborative that integrates source internal and external knowledge in the process of creation and commercialization innovation. In context this study, approach *open innovation* become runway conceptual for explain how BUMDes builds collaboration with various stakeholders interests to strengthen capacity institutional, producing innovation, as well as push empowerment sustainable society.

2.3. Sustainable Community Empowerment

Draft development experience very dynamic development along with increasing complexity challenge global development. In the 1980s, the paradigm development more focus on growth economy as instrument main. For increase welfare community. Approach the assume that growth economy will produce equality welfare through mechanism *trickle-down effect*. However, the implementation paradigm the show that orientation development that only focused on growth economy precisely bring up various problems, such as increasing inequality social, damage environment, crisis agrarian, as well as decline quality life public rural areas [45].

Condition the push birth paradigm development sustainable *development* which places dimensions economic, social and environmental as one mutual unity related. Paradigm This confirm that success development No only measured from growth economy, but also from ability guard sustainability environment, improve welfare social, as well as ensure sustainability development for generation upcoming.

Although various countries have adopt policy development sustainable, its implementation still face challenge because development often more focus on aspects economy compared to dimensions social and environmental. Globalization, liberalization economy, and increasing role sector private sector has also change paradigm development so that demand government and society for build pattern more collaboration adaptive and participatory.

In development, development sustainable the more emphasize importance people-centered *development* approach. This put public as perpetrator main development through an empowerment process that encourages improvement capacity, participation, and independence public in manage source the power possessed [46]. Empowerment public no again viewed as an aid program, but rather as a development process that provides chance to public for determine direction development in accordance with needs and potential local.

In context regional development, community rural areas own role strategic in realize inclusive and sustainable development. Success development rural areas are very much determined by the ability public in manage potential local through innovation, entrepreneurship, and utilization natural resources in a way sustainable. Therefore that, policy development village must capable strengthen capacity public at a time increase Power competition economy local [47].

Involvement public in development also requires support strong institutional framework. Institutions local own function important in develop activity economy public through network entrepreneurship, collaboration inter-stakeholder interests, as well as transformation economy area-based. In the Indonesian context, Village-Owned Enterprises (BUMDes) are one of the form institutional local role as driving force development economy village through utilization potential local and strengthening participation public. Economic development that is not notice sustainability environment potential cause various impact negative, such as decline productivity agriculture, increasing poverty, damage natural resources nature, as well as worsening quality health society. Therefore that, development sustainable demand existence integration between dimensions economic, social and environmental well-being public can achieved without sacrifice sustainability natural resources [48].

Besides the three dimensions mentioned, aspects institutions also become factor important in realize development sustainable. Institutions based on principle equality, justice, and participation public capable build connection strengthening collaboration capacity public in manage development in a way independent. With thus, success development sustainability is greatly influenced by the ability institution local in build synergy inter-stakeholder interest.

Kurniawan et al. [45] stated that development public sustainable implemented through three main strategies. First, provision service base for increase quality life society, including service health, education, sanitation, and fulfillment need base others. Second, strengthening values social through creation equality, justice, peace, and equal opportunity for all over society. Third, increasing capacity society to be able to participate in a way active in the process of taking decisions and formulation policy development. These three strategies each other complete in form an independent, participatory and empowered society competitive.

Empowerment public sustainable No only improvement - oriented capacity economy, but also includes development knowledge, skills, motivation, attitudes, behavior, and awareness public to importance sustainability. Empowerment community that is carried out in a way participatory capable increase ability public in identify problems, develop potential local, as well as create appropriate solution with characteristics its territory. Approach This different with a development model that is *top-down*, because public become actor main in every stages development. [49]

In Indonesian context, implementation empowerment public sustainable Still face various challenges. Development programs often still oriented towards administrative targets and less notice values culture as well as wisdom local *wisdom* that develops in society. In fact, local wisdom local is an important social capital in push emergence innovation, strengthening participation society, as well as increase effectiveness development village.

Strengthening empowerment public sustainable is also in line with implementation of the Sustainable Development Goals or SDGs) which become continuation from *Millennium Development Goals* (MDGs). the SDGs were built on five principles main (5P), namely *People, Planet, Prosperity, Peace, and Partnership*. The five principle the put man as center development, maintaining sustainability environment, creating inclusive prosperity, building peaceful life, and strengthen partnership inter-stakeholder interest in reach objective development sustainable [50].

The fifth principle the each other related and become runway in realize inclusive development as well as sustainable. Principles *People* emphasize importance alleviation poverty and improvement quality life society. Principles *Planet* protection - oriented environment and utilization natural resources natural in a way sustainable. Principles *Peace* emphasize creation a just, safe and free life from violence. Principle *Partnership* put forward collaboration between government, society, business world, universities high, and various stakeholders interest others. As for the principles *Prosperity* aim realize welfare public through development an inclusive, equitable and sustainable economy [51].

Based on various perspective said, empowerment public sustainable in study This understood as a process of improvement capacity community that is implemented in a way participatory through strengthening institutional, utilization potential local, collaboration inter-stakeholder interests, as well as development innovation that is capable

create balance between dimensions economic, social, and This environmental approaches become runway conceptual for analyze how BUMDes is able integrate open innovation with empowerment public in realize development sustainable village.

2.3. Novelty (*Novelty/State of the arts*).

In frame look for novelty from study this , done analysis regarding written articles with using relevant keywords in research . Keywords First is *empowerment* , which shows how much far study latest to *empowerment* has done. The image below show cement with use application *Vos Viewer* which provides indication that *empowerment* has become object adequate research .

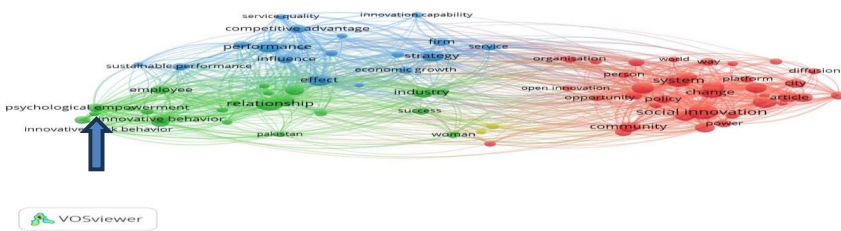


Figure 1. Empowerment processed Net Work visualization results VOSviewer .

After identifying articles on empowerment, a further review of articles using the keyword "open innovation" was conducted. This resulted in the image below, showing various recent articles published by researchers on open innovation. This also indicates that the keywords "empowerment," followed by "open innovation," have been the subject of considerable research in recent years, particularly from 2017 to 2022.

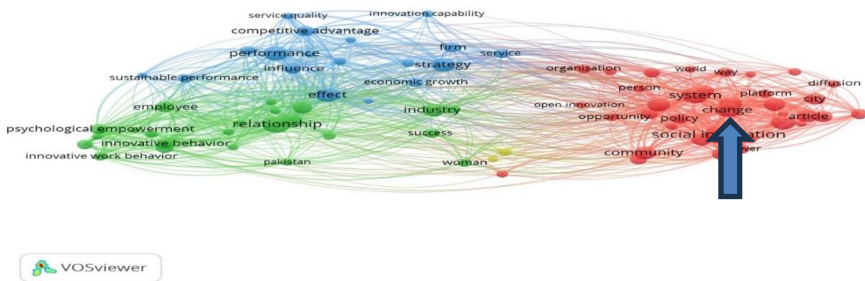


Figure 2. *Open Innovation* results from processed Network visualization VOSviewer .

The keyword used as a follow-up was "sustainability." This was to identify articles written on open innovation and empowerment related to sustainability. The image below was generated by VOS Viewer to illustrate various recent articles on sustainability related to open innovation and empowerment, published years 2017 to 2022.

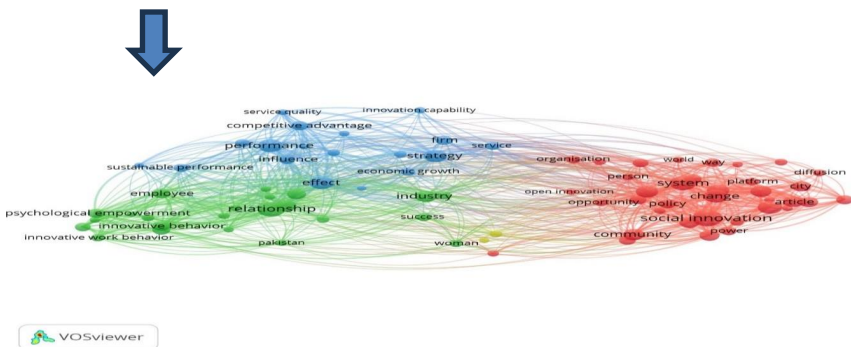


Figure 3. Sustainability of processed Net Work visualization results VOSviewer

Based on the search results above, there is an indication of novelty in this research, which will address the topic of "Open Innovation for Sustainable Empowerment in Village-Owned Enterprises: An Empirical Model Evidence." This theme is the intersection of open innovation and empowerment. Furthermore, these themes are re-

inforced by the theme of sustainability, which is expected to produce an open innovation model that can benefit the future development of Village-Owned Enterprises (BUMDes).

3. Research methods

3.1. Research Approach and Type

Topics study This use approach in a way qualitative research qualitative is something research own objective for understand problem man based on holistic explanation, description in sentences and information informants carried out in situations or condition natural. Appropriate with Stake's [52] statement that study qualitative aim for state identifying characteristic or the uniqueness (dynamics) of the elements that exist in the problem being researched, so that change variables observation from time to time in study this emphasized. Research qualitative give chance to researchers for see the world through glasses research or participants [53].

Qualitative methods chosen because method the give complex description about difficult event depicted through method quantitative [54]. Topic This will use approach qualitative or also called post positivism. For question study first and second as well as the third related with open innovation For empowerment sustainable For BUMDes business as the power of the practice model innovation sustainable development of BUMDes , researchers use approach *post positivism*.

Study *post-positivist* describe existence need for identify the causal factors that can influence results based on observation and testing to reality objective. According to Philips & Burbuler [55] there are a number of assumptions underlying beginning post-positivist paradigm, namely 1) knowledge no will once obtain truth absolute , 2) research is a filtering process so that become claim own distant truth more strong, 3) researcher must capable develop relevant and *correct* statements, 4) attitude objective in study.

This Study started with analysis implementation empowerment public about village in utilization of village funds, scheme formation, establishment and management the village is one of them for increase welfare village in village Jawa Barat, then followed with analysis empowerment community in the BUMDes program, and finally formulated strength open innovation Bumdes Program as something strength development sustainable BUMDes management that can overcome findings study previously. This means that research try to tell repeat phenomena that occur and create formulation design based on phenomena encountered. This Research do data analysis inductive, through the process of processing the resulting data interview with partisans (informants) BUMDes *stakeholders* and informants others who support to in more detailed units of information abstract .

3.2. Collection Location

Research location will carried out at the Provincial BUMDes West Java, Indonesia. There are a number of BUMDEs types based on Regulation Government Number 11 of 2021 Article 71 and also the Regulation Ministry of Villages, Disadvantaged Regions and Transmigration Number 3 of 2021 Article 22, namely: Category A (Advanced BUMDes); Category B (Developing BUMDes); Category C (Beginning BUMDes); Category D (Pioneer BUMDes). Justification in election location study the is West Java Province is the largest region in Indonesia and all village Already have BUMDes.

Village Development Index (VDI) is used as tool help measurement for development of village status. Starting In 2019, IDM data for West Java Province showed increase Enough significant . In 2022 and 2023 the increase Independent Village Status increased from the previous one from 1,130 to 1,828 villages. The number of advanced villages also increased from 2,511. improvement namely 2,553 villages and leaving no village behind.

3.3. Selection Techniques Informant .

Subject study or informant chosen purposively or in a way intentionally. Selected informants is *key person*. Selected key person in study This represent a number of stakeholders interest.

Group informant in this study consists of on :

Table 1. Group Informant

Group Informant	Criteria Informant
Government	Officials at the Directorate General and the Community and Village Empowerment Service (DPMD) of West Java Province which has authority in development and coaching of BUMDes.
Academics	Academics who have competence, experience research , and expertise in the field empowerment society, development village, as well as BUMDes management.
BUMDes Association	Administrator or representative Association of Village-Owned Enterprises that understands development institutions and practices BUMDes management.
BUMDes Manager	Directors, administrators, supervisors, and implementer BUMDes operations involved direct in management of business units and implementation of empowerment programs public.

Stakeholder interests selected by researchers as informant has fulfil criteria as following [56] ;

1. Understand and master problem study with good (acculturation) full).
2. Get involved direct with current issues researched .
3. Have freedom time in give explanation related problem study .
4. Not delivering information results thinking Alone .
5. Do not have proximity with reseacher .

Source Information on research This consists of from secondary data , namely those related with book written results, results research, journals, news letters, and various source information others who have published in relation to with BUMDes in development. This data support the primary data obtained from field. This study primarily relied on primary data, while secondary data were used to support and validate the analysis. The data positioned in position comparison and complement to the primary data found in research. Primary data is important data obtained in the field, through studies documents, interviews and observations.

3.4 Data Collection Techniques and Time .

Topics study will used method data collection including is :

1. In-depth Interview

Interview in-depth is a rose gets material with method talk and meet in a way live. This interview intended for collection information as much as possible from informant. Interview the done so that the results interview can answer question. It was also explained that *In-depth interview* is interviews conducted personally, no structured and direct with a respondents conducted by researchers who have skills so as not to there is conflict interest to the topic being researched [57].

Election key informant said, at least it can sufficient evaluation as source person or enough in accordance as said by Neuman [58], namely:

- Source person understand correct with topic research and in competent situations for witness incident so that make it as good informant.
- Source person is at in scope problem object research at the time done interview. However if key informant the Already outside field research, then If the longer you stay outside object research, they will the more a lot of interview data to be collected arranged return.
- Source person give time availability for researcher.

2. Documentation techniques.

Source document is means complement researchers for collect data or information with method get and describe regulation and research previously [59]. With learn documents the can get description more in about empowerment society and innovation Development of Village-Owned Enterprises (BUMDes) in Indonesia. Documentation implemented through study to document related with various policies, regulations, and results agreement in the modeling process empowerment public in innovation development of BUMDes which has the power competitiveness and sustainability.

3.5. Data Analysis Techniques

Data analysis was performed with help system *Computer Assisted Qualitative Data Analysis Software (CAQDAS) software*, namely NVivo 12. This software is something tool qualitative data analysis. Data analysis techniques are carried out with objective for create data that has been obtained become more easy for analyzed. Data analysis in study This nature descriptive qualitative, namely processing of the data obtained through interviews and studies library so that obtained something information that can made into material For research and discussion as well as put forward findings. The data analysis process begins with create result data interview can explained in sentence with classify all data and connect with related data. Source the furthermore will reduced so that obtained separate data between the data that is required for research data and that which is not from results interview.

4. Discussion and Discussion .

4.1. BUMDes innovation with utilization source *In-bond* internal knowledge

For the development process product or services, BUMDes can depend on research and development from party external. This is happen because BUMDes is lacking facility research and development so that No capable compete in local and global markets with more goods and services sophisticated. Therefore that, understanding draft open innovation is very important For ensure success its implementation. For ensure cooperation external as well as enthusiasm employees and success management operational,

required evaluation comprehensive to open innovation, especially among BUMDes such as challenge organization, level readiness employees and concerns operational.

Implementation open innovation lots done especially in technology - oriented companies tall although there is open innovationness is also very important for company small such as BUMDes. In fact, many study has confirm return benefit activity open innovation for BUMDes and businesses small, especially connection collaborative between BUMDes and the company big For produce goods half so, BUMDes must integrate with party external in industry for increase performance they innovative. Challenge crucial issues faced company in identify and create collaboration is riches intellectual, connectivity, and access connectivity external. Capacity those who are limited in find natural resources has encourage BUMDes to find method new for overcome challenges caused by change market forces and causes arrangement back to BUMDes.

BUMDes and companies small can get more benefits big from activity open innovation. Although BUMDes and UKM play role key in innovation, However still found difficulty for apply it. Open innovation has defined as entry and exit knowledge technology for advance innovation in production and determination market position . Innovation basically open is a concept in which the organization depending on the source external in matter competition. Innovation model existing closed moment this no can implemented for produce product or services, because environment existing innovations has changed in a way drastically. Therefore that, BUMDes needs use method innovation alternative; internal and external approaches need explored For develop tool with objective get knowledge from source external.

Entry knowledge technology allows BUMDes to utilise ability technology moment This beyond organizational boundaries . This is called as breakthrough technology , with objective to obtain and obtain knowledge external For improvise development technology moment this . This thing allows BUMDes to operate For develop ability technology and competence For compete in domestic and international markets . Small and medium enterprises and BUMDes needs to adopt draft open innovation For interesting more Lots investment and stimulate growth economy.

Implementation Open innovation from outside to in BUMDes refers to the practice acquisition of ideas, technology and knowledge from source external. This is done can covers customers, suppliers, universities, institutions research, and organization others. One of them BUMDes's goal is to implement open innovation from outside to in is for present new perspectives and ideas to in company and take advantage of expertise and natural resources partners external for solve challenges and competition business.

Use source internal knowledge for BUMDes regarding innovation product has can prove there is contribution related utilization source internal knowledge for development innovation product . Findings This confirm that source internal knowledge in the BUMDes environment is very important its utilization and can contribute to development innovation products and services. Use source internal knowledge is something source information obtained from from in organization in the form of sources used as element evaluation in something problem or used for improvement performance in the organization as well as can used as base for see opportunities that arise in *the market* . According to Elche- Hotelano [60] and Indarti [61] sources the as can obtained through employee or the owner.

Relatedness with BUMDes, competence employee can represent if needed knowledge new. This is can required something the existence of a program training or education internal organization for more increase knowledge foundation and internal organization [62]. In the end use the emergence of creative ideas from employee from implementation existence channel submission of suggestions from employee so that transfer ideas to support innovation his organization.

4.2. Innovation with Out-bound Technology and Commercialization

Utilization open innovation from in to outside use technology and commercialization of ideas with method through license, sell, or turn it around to partners external. Utilization source This can help company patenting riches intellectual them and produce confession on results riches intellectual that can shaped production output brand or services. Source open innovation from in to outside is also possible help manager or manager company for focus on their core competencies while utilise skill partners external for present products and services new to the market.

4.3. Open Innovation in Sustainable Community Empowerment

Open innovation become driver sustainable success of BUMDes with use principles development society, from village left behind become advanced village can analyzed with a number of principle: (1). Principle about definition needs. Principles This emphasize that individual in public need invited dialogue that will make they become more understand his real needs, not know need needs created by other individuals (people) outside they so that need it is the community that must prioritized [63]. Approach development local communities (*community development*) based on felt needs of the community in start the process stated by Glen in Adi [32]. With notice desired needs society on the other hand will get closer connection between perpetrator with inhabitant public.

Empowerment program BUMDes community, review process need done through dialogue with society. This process can seen from the initial process of the program, the implementation of the deliberation dialogue starting at the level society and government village, BPD and community leaders. After draft the establishment of BUMDes has been ripe, then submitted funding sourced from from village funds where village funds the is allocation from Budget State Revenue and Expenditure and its parts from the provincial budget provided to the Regency or a city that is general and specifically managed in APBDes (Top Down). From this process can seen that empowerment community activities carried out that pushes the birth of BUMDes with nuances prefixed combination with *the bottom up* process to be continued with *top down*.

Principles value knowledge local. Knowledge (*Science*) and expertise (*skills*) are ones that have important meaning in give information about development society that must recognized and utilized, right? positioned as material consideration second from knowledge and skills of outsiders. Principles This used by BUMDes in choose administrator or perpetrator the main thing. Where is the science knowledge and skills possessed used with help technology and cooperation Good with internal and external parties external. Contribution perpetrator community is learn and listen from community public No intervene decision How overcome problem they, members it is the community that is more own experience knowledge about community Good strengths, weaknesses, needs, problems as well as character local [63].

Utilization the sources above in accordance with directions to the Government President Joko Widodo, where stated in Article 112 paragraph (3) states that Government, Provincial and Regency Governments or city empowering public by ; a) utilizing results development knowledge knowledge (science) and technology, technology appropriate and findings new For progress economics and agriculture public village; b) improve quality government and society village through education, training and counseling; c). Recognizing and functioning institutions and or institutions that have There is in society. Activities public for develop and preserve activity business in BUMDEs is something step sustainability.

4.3.1. Sustainability Environment

Empowerment program sustainable society in BUMDEs, society participate active together government make an effort create atmosphere each other support through *“enable, empower and protection”* approach. This effort covers aspect economic, social, cultural, environmental, partnership and prosperity. So that achievement improvement welfare public village can become independent village.

Participation all stakeholders in monitoring and evaluation BUMDEs operations are also one of the role or function in business guard sustainability BUMDEs business. This in accordance with results interviews obtained in the field, that public village participate active become supporters activity BUMDEs business unit. Savings fund business unit borrowing BUMDEs almost all inhabitant public village become member or customer awareness inhabitant village willing become customers in activity save and borrow capital for business . Membership inhabitant village in business save BUMDEs loans are also supported behind by facilities convenience access borrow business capital. Next besides with use product or service from results production or services provided by BUMDEs to the community in the village including guard the existence of BUMDEs with contribute become consumer on BUMDEs products and services.

In accordance with mandate the establishment of BUMDEs that BUMDEs business does not only emphasizes profit but also on the side social. BUMDEs provides opportunities and chances to inhabitant society village for contribute as administrator or BUMDEs employees . This is also done in frame guard sustainability the existence and future efforts of BUMDEs . The programs carried out by BUMDEs in accordance with results research [64] that BUMDEs does not only focused on achieving profit, but also providing chance to society that has competence and desire For join contribute in increase skills with become BUMDEs administrators.

BUMDEs also participates guard environment matter this can seen from the existence of a business unit management waste management unit rubbish this background behind the existence of disturbance environment around the village market and the BUMDEs office and the Village Head Office. This caused by waste waste generated by markets that do not Can handled previously by the service cleanliness government Bandung Regency . Previously BUMDEs has make contract in management rubbish with the Sanitation Department Bandung Regency . However Because happen absence ability the service for carry garbage , resulting in market waste piles up and causes unpleasant smell delicious so that disturbing village market activities as well as public village. From the condition said, the Director of BUMDEs has an idea to create a business unit management trash that is not only serve and manage rubbish from village market produce , but also waste from waste public village. Business unit management

BUMDes waste begins since 2019. Until moment this is a business unit management still walk .

Principle sustainability environment in BUMDes businesses also includes ability For guard balance environment, quality good air and water, as well reduce impact negative to environment. Involvement sustainability environment BUMDes business is also related with preservation natural resources nature and use energy renewable. This is important done remember sustainability environment become the more clear along with increasing attention government center even countries in the world against problem global environment such as change climate , depletion layer ozone, and pollution. Efforts made by BUMDes to minimize impact negative to environment is also one of guard development sustainable village . Achievements BUMDes performance is also form from sustainability economy. BUMdes must still focus on growth sustainable and responsible economy answer on business and management with notice efficiency, innovation, and quality life. Priority in sustainability economy focused on needs For guard growth balanced and developing economy friendly business environment. Then from that, sustainability economy become the main thing in achievement objective sustainable development .

4.3.2. Sustainability

In maintain sustainable innovation in Eastern Ethiopia, also use indicator utilization technology as a process in look after continuity a program. With see rapid distribution technology new so capacity local For use and maintain utilization method technology new will ensure sustainability innovation. This is due to first , modification innovative farmer to technique new for overcome problems that arise in society and in accordance needs. Second, ownership local on technology new, including skills used make modified technology affordable and can accessible to the public the majority. Third, innovation This spread in a way organic to ensure the sustainability of the process [65].

Principle empowerment sustainable society also becomes topic findings from Research. The research in an effort to identify potential natural resources at each sector as base For resilience food and natural resurces sustainable economy. The results of his research found that agriculture sustainable must attempted with based on three principle sustainability, namely : continuity life term long company commercial (*profit*), continuity life social people in term length and continuity ecosystem nature (*planet*) in term long. That third principle sustainability the covers dimensions economy related with maximize flow profit with at least manage asset existing productive as runway benefits. Power achievements competitiveness and efficiency, improvement mark plus is indicator main element economic elements economy emphasize on fulfillment need economy generation present and future. Dimensions social is view state administration tied to desires welfare social life represented peaceful social (including prevention dispute social), preservation diversity culture and social capital culture, including protection ethnicity minority. Last Dimensions environment is ecosystem natural containing life biological and natural materials must stable , appropriate with dimensions environment nature. Conservation diversity source life and power thrust, land , water and natural resources others, as well as health and comfort environment, everything covered in this matter as something guarantee sustainable innovation [66].

Furthermore research conducted using review literature systematic against 88 studies about innovation root grass For transition sustainability that uses lens power

and empowerment . His findings power identity - oriented constitution and empowerment about modality connection human-nonhuman that is connection together with social norms, hierarchies, and institutions, allowing or limit innovation root grass for build awareness and imbalance directive power they for use they strength strategic. Through formation return identity collective, innovation root grass against neoliberal ways in social interaction in systems involved with type technology and infrastructure related certain for push inclusion and participation groups in transition sustainability and fighting connection power that is not fair. Strength and empowerment innovation root grass in transition sustainability at the level micro, this moment part big concerning change behavior. Changes behavior is just one of them focus potential at level micro. This is promising approach to power and empowerment innovation root grass on the level micro [67].

4.3.3. Sustainability

BUMDes also plays a role in guard sustainability social through activity in help provide social funds, assistance education costs and health improvement programs. With condition inhabitant Village communities that are educated, healthy and have chance so sustainability social can keep going ongoing with build an inclusive, participatory and engaged society in development sustainable. The importance of sustainability social lies in the importance of in provide a sense of justice and prosperity social in reach sustainable development. The existence of justice social and recognition on right basic man must recognized and respected for this reach objective is a sustainable development process. must consider need social and welfare public in a way overall. In the end in a way overall, benefits principle sustainability BUMDes business is very important for welfare humans and the environment inhabitant village wangisagara in particular and the world community in general. Sustainability from implementation principle sustainability must done as investment term length that can give significant results for business business, society and environment in a way overall.

In development villages that use definition and articles as well as existing verses in Law No. 6 of 2014 concerning Villages, the planning of which is initiated by and active participation public together with government village including inside it with take advantage of wisdom local and natural resources natural village. Activities the aim to increase welfare society and raise level life public as well as overcome poverty through fulfillment need life base as well as utilise natural resources sustainable nature and environment .

Elements important things contained in The definition of Village Development above is : the existence of empowerment village community, involvement good village community in planning and implementation, utilization wisdom local and natural resources natural local, improvement welfare and quality life community, utilization natural resources nature and environment in a way sustainable.

Basically an empowerment program must designed for sustainable, even though at the beginning the process role companion more dominant compared to angaoata community public alone. However in a way gradually and slowly as well as sure, role companion will the longer the more reduced, even in the end the empowerment program must deleted, because public already reach the goal or already capable manage his activities alone.

BUMDes must innovative for fulfil they mission social, who need ability For survive and thrive in face internal and external constraints . In addition , innovation

emphasized as component important from BUMDes' ability to utilise source limited power and managing request from diverse stakeholders interests. The potential of BUMDES for innovate nature dynamic and can changed along walking time. Due to the unique character of BUMDes, the capacity they in innovate different with company commercial. Meanwhile company commercial usually concentrate on production product or unique services, BUMDes usually concentrate on change or configuration repeat existing products and services moment.

4.3.4. Sustainability Partnership

BUMDes must capable weave partnership and mutual support both within the internal community village in West Java and with public outside village. Partnership This based on bonds and solidarity between member community at the level village. Factors of togetherness and closeness This become runway for each other Work equal and supportive for empowerment sustainable society. For partnership with public outside village done with form strong network between village communities with with the surrounding areas. The partnerships made are very important in expand potential work same and access to utilization source more power wide.

There will be a partnership form strong network between village with the surrounding area For become connector between BUMDes and with government and institutions related others. The role of the government in supporting empowerment and protection is a capital of strength in sustainable BUMDes development. When the partnership formed with good pattern, BUMDes Niagara and village community can face various challenges and become more independent as well as sustainable.

4.3.5. Sustainability going to prosperity

Sustainable Community Empowerment must can guard balance and harmony various aspects. BUMDes must collaborate with the Community in guard condition peace and security as well as conducive climate for business . Management Village Development Agency in a way wise and responsible as well as guard condition peace public village. Therefore that condition conducive security and peace are very relevant in guard continuity sustainable BUMDes business .

BUMDes as something institution must can play a role as agent empowerment public village in utilise existing sources in a way sustainable. BUMDes has ability to increase participation active public in improvement welfare and support aspirations going to prosperity village. Government need give support to empowerment public village in reach out the purpose. The government create supportive environment development of BUMDes through policy related to the goal prosperity village can achieved. Approach man as perpetrator development is the right approach strategy for reach objective.

5. Conclusion

This study show that open innovation is mechanism strategic for strengthen empowerment sustainable society through Village-Owned Enterprises (BUMDes). Findings show that sustainable BUMDes development depends on integration practice open innovation inbound and outbound. On the other hand, open innovation outbound facilitates commercialization innovation local, diffusion knowledge, and expansion market access through partnership strategic and utilization technology. This study more carry on disclose that effectiveness open innovation strengthened when integrated in principles empowerment public participatory. In addition, empowerment sustainable society

reflected through integration dimensions environment, economy, social, partnership, and prosperity. In this general collective findings support proposition that company sustainable villages requires a governance model integrated which combines open innovation, empowering society, and principles sustainability.

6. Implications Theoretical

This study contribute to the literature open innovation with expand its implementation from company oriented technology to company rural based society. Therefore that, research This expand coverage theoretical open innovation with positioning public local as creator innovation active, not as recipient benefit passive. More further research This advance literature empowerment public with integrate theory empowerment with perspective open innovation and development sustainable. Framework Work proposed conceptual show that sustainable BUMDes performance appear from interaction between exchange knowledge, governance collaborative, wisdom local, and results multidimensional sustainability.

7. Implications Practical

This Findings offer a number of implications practical for the makers government policy village, and BUMDes managers. First, the institution government must develop policies that encourage ecosystem open innovation with facilitate collaboration between BUMDes, universities, institutions research, company private sector and community local. Second, BUMDes managers must institutionalize mechanism share knowledge, encourage creativity employees, and build partnership strategic to increase performance innovation and power market competitiveness. Third, empowerment sustainable society must still become objective main development of BUMDes. Finally, the proposed integrated model in this study give reference practical for designing policies and frameworks purposeful governance work for strengthen business village sustainable.

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